THE UNIVERSITY OF AKRON

Akron, OH 44325

DEPARTMENT OF CHEMICAL ENGINEERING

GRADUATE PROGRAM

FACULTY	RESEARCH INTERESTS
G.A. ATWOOD	Digital Control, Mass Transfer, Multicomponent Adsorption.
J.M. BERTY	Reactor Design, Reaction Engineering, Syngas Proccesses.
H.M. CHEUNG	Colloids, Light Scattering Techniques.
S.C. CHUANG	Catalysis, Reaction Engineering, Combustion.
J.R. ELLIOTT	Thermodynamics, Material Properties.
*G. ESKAMANI	Waste Water Treatment.
L.G. FOCHT	Fixed Bed Adsorption, Process Design.
H.L. GREENE	Oxidative Catalysis, Reactor Design, Mixing.
S. LEE	Synfuel Processing, Reaction Kinetics, Computer Applications.
R.W. ROBERTS	Plastics Processing, Polymer Films, System Design.
R.F. SAVINELL	Electrochemical Engineering. (On Leave)
M.S. WILLIS	Multiphase Transport Theory, Filtration, Interfacial Phenomena.

*Adjunct professor

Graduate assistant stipends for teaching and research start at $6,000. Industrially sponsored fellowships available up to $13,000. These awards include waiver of tuition and fees. Cooperative Graduate Education Program is also available. The deadline for assistantship application is March 1.

ADDITIONAL INFORMATION WRITE:

Dr. Howard L. Greene, Head
Department of Chemical Engineering
University of Akron
Akron, Ohio 44325

THE UNIVERSITY OF ALABAMA

GRADUATE PROGRAMS FOR M.S. AND PH.D. DEGREES IN CHEMICAL ENGINEERING

The University of Alabama, enrolling approximately 14,000 undergraduate and 3,000 graduate students per year, is located in Tuscaloosa, a town of some 70,000 population in West Central Alabama. Since the climate is warm, outdoor activities are possible most of the year.

The Department of Chemical and Metallurgical Engineering has an annual enrollment of approximately 200 undergraduate and 25 graduate students. For information concerning available graduate fellowships and assistantships, contact: Director of Graduate Studies, Department of Chemical and Metallurgical Engineering, P.O. Box G, University, AL 35486.

FACULTY AND RESEARCH INTEREST

G.C. April, Ph.D. (Louisiana State): Biomass Conversion, Modeling, Transport Processes

D.W. Arnold, Ph.D. (Purdue): Thermodynamics, Physical Properties, Phase Equilibrium

A.M. Lane, Ph.D. (Massachusetts): Catalysis, Safety Health and Environment

W.C. Clements, Jr., Ph.D. (Vanderbilt): Process Dynamics and Control, Micro-computer Hardware

W.J. Hatcher, Jr., Ph.D. (Louisiana State): Catalysis, Chemical Reactor Design, Reaction Kinetics

I.A. Jefcoat, Ph.D. (Clemson University): Synfuels Environmental, Alternate Chemical Feedstocks

E.K. Landis, Ph.D. (Carnegie Institute of Technology): Metallurgical Processes, Solid-liquid Separations, Thermodynamics

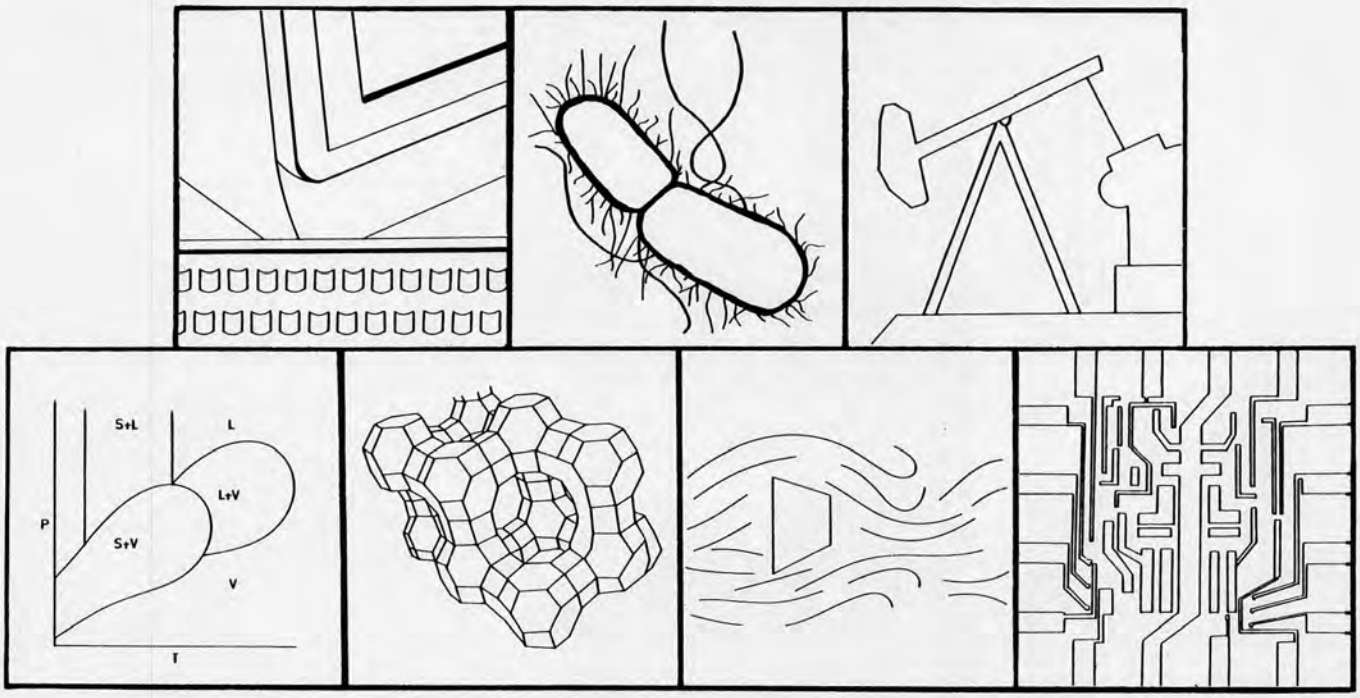
M.D. McKinley, Ph.D. (Florida): Coal and Oil Shale Mass Transfer, Separation Processes

L.Y. Sadler, III, Ph.D. (Alabama): Energy Conversion Processes, Rheology, Lignite Technology

Chemical Engineering at

UNIVERSITY OF ALBERTA

EDMONTON, CANADA



FACULTY AND RESEARCH INTERESTS

K.T. CHUANG , Ph.D. (Alberta): Mass Transfer, Catalysis.

P.J. CRICKMORE , Ph.D. (Queen's): Applied Mathematics.

I.G. DALLA LANA , Ph.D. (Minnesota): Kinetics, Heterogeneous Catalysis.

D.G. FISHER , Ph.D. (Michigan): Process Dynamics and Control, Real-Time Computer Applications.

M.R. GRAY , Ph.D. (Caltech): Chemical Kinetics, Characterization of Complex Organic Mixtures, Bioreactors.

R.E. HAYES , Ph.D. (Bath): Numerical Analysis, Transport Phenomena in Porous Media.

D.T. LYNCH , Ph.D. (Alberta): Catalysis, Kinetic Modelling, Numerical Methods, Reactor Modelling and Design.

J.H. MASLIYAH , Ph.D. (British Columbia): Transport Phenomena, Numerical Analysis, Particle-Fluid Dynamics.

A.E. MATHER , Ph.D. (Michigan): Phase Equilibria, Fluid Properties at High Pressures, Thermodynamics.

A.J. MORRIS , Ph.D. (Newcastle-Upon-Tyne): Process Control, AI and Expert Systems.

W.K. NADER , Dr. Phil. (Vienna) Heat Transfer, Transport Phenomena in Porous Media, Applied Mathematics.

K. NANDAKUMAR , Ph.D. (Princeton): Transport Phenomena, Process Simulation, Computational Fluid Dynamics.

F.D. OTTO , Ph.D. (Michigan), DEAN OF ENGINEERING: Mass Transfer, Gas-Liquid Reactions, Separation Processes, Heavy Oil Upgrading.

D. QUON , Sc.D. (M.I.T.), PROFESSOR EMERITUS: Energy Modelling and Economics.

D.B. ROBINSON , Ph.D. (Michigan), PROFESSOR EMERITUS: Thermal and Volumetric Properties of Fluids, Phase Equilibria, Thermodynamics.

J.T. RYAN , Ph.D. (Missouri): Energy Economics and Supply, Porous Media.

S.L. SHAH , Ph.D. (Alberta): Computer Process Control, Adaptive Control, Stability Theory.

S.E. WANKE , Ph.D. (California-Davis), CHAIRMAN: Heterogeneous Catalysis, Kinetics.

R.K. WOOD , Ph.D. (Northwestern): Process Simulation, Identification and Modelling, Distillation Column Control.

For further information contact:

CHAIRMAN,
Department of Chemical Engineering,
University of Alberta,
Edmonton, Canada T6G 2G6

THE UNIVERSITY OF ARIZONA

TUCSON, AZ

The Chemical Engineering Department at the University of Arizona is young and dynamic with a fully accredited undergraduate degree program and M.S. and Ph.D. graduate programs. Financial support is available through government grants and contracts, teaching, and research assistantships, traineeships and industrial grants. The faculty assures full opportunity to study in all major areas of chemical engineering. Graduate courses are offered in most of the research areas listed below.

THE FACULTY AND THEIR RESEARCH INTERESTS ARE:

MILAN BIER, Professor
Ph.D., Fordham University, 1950
Protein Separation, Electrophoresis, Membrane Transport

HERIBERTO CABEZAS, Asst. Professor
Ph.D., University of Florida, 1984
Liquid Solution Theory, Solution Thermodynamics
Polyelectrolyte Solutions

WILLIAM P. COSART, Assoc. Professor, Assoc. Dean
Ph.D., Oregon State University, 1973
Heat Transfer in Biological Systems, Blood Processing

EDWARD J. FREEH, Adjunct Professor
Ph.D., Ohio State University, 1958
Process Control, Computer Applications

JOSEPH F. GROSS, Professor
Ph.D., Purdue University, 1956
Boundary Layer Theory, Pharmacokinetics, Fluid Mechanics and Mass Transfer in The Microcirculation, Biorheology

SIMON P. HANSON, Asst. Professor
Sc.D., Massachusetts Inst. Technology, 1982
Coupled Transport Phenomena in Heterogeneous Systems, Combustion and Fuel Technology, Pollutant Emissions, Separation Processes, Applied Mathematics

GARY K. PATTERSON, Professor and Head
Ph.D., University of Missouri-Rolla, 1966
Rheology, Turbulent Mixing, Turbulent Transport, Numerical Modelling of Transport

ARNE J. PEARLSTEIN, Asst. Professor
(Joint with Aerospace and Mechanical)
Ph.D., UCLA, 1983
Boundary Layers, Stability, Mass and Heat Transport

THOMAS W. PETERSON, Assoc. Professor
Ph.D., California Institute of Technology, 1977
Atmospheric Modeling of Aerosol Pollutants, Long-Range Pollutant Transport, Particulate Growth Kinetics, Combustion Aerosols

ALAN D. RANDOLPH, Professor
Ph.D., Iowa State University, 1962
Simulation and Design of Crystallization Processes, Nucleation Phenomena, Particulate Processes, Explosives Initiation Mechanisms

THOMAS R. REHM, Professor
Ph.D., University of Washington, 1960
Mass Transfer, Process Instrumentation, Packed Column Distillation, Computer Aided Design

FARHANG SHADMAN, Assoc. Professor
Ph.D., University of California-Berkeley, 1972
Reaction Engineering, Kinetics, Catalysis, Coal Conversion

JOST O. L. WENDT, Professor
Ph.D., Johns Hopkins University, 1968
Combustion Generated Air Pollution, Nitrogen and Sulfur Oxide Abatement, Chemical Kinetics, Thermodynamics, Interfacial Phenomena

DON H. WHITE, Professor
Ph.D., Iowa State University, 1949
Polymers Fundamentals and Processes, Solar Energy, Microbial and Enzymatic Processes

DAVID WOLF, Visiting Professor
D.Sc., Technion, 1962.
Energy, Fermentation, Mixing

Tucson has an excellent climate and many recreational opportunities. It is a growing, modern city of 450,000 that retains much of the old Southwestern atmosphere.

For further information, write to:

Dr. Farhang Shadman
Graduate Study Committee
Department of
Chemical Engineering
University of Arizona
Tucson, Arizona 85721

Arizona State University

Graduate Programs for M.S. and Ph.D. Degrees in Chemical Engineering, Biomedical Engineering, and Materials Engineering

Research Specializations include:
ADSORPTION/SEPARATIONS • CRYSTALLIZATION • TRANSPORT PHENOMENA • REACTION ENGINEERING • BIOMEDICAL ENGINEERING • BIOMECHANICS • BIOCONTROLS • BIOINSTRUMENTATION • BIOMATERIALS • CARDIO-VASCULAR SYSTEMS • COMPOSITE/POLYMERIC MATERIALS • CERAMIC/ELECTRONIC MATERIALS • HIGH TEMPERATURE MATERIALS • CATALYSIS • SOLID STATE SCIENCE • SURFACE PHENOMENA • PHASE TRANSFORMATION • CORROSION • ENVIRONMENTAL CONTROL • ENERGY CONSERVATION • ENGINEERING DESIGN • PROCESS CONTROL • MANUFACTURING PROCESSES •

Our excellent facilities for research and teaching are complemented by a highly respected faculty:

James R. Beckman (Arizona)
Lynn Bellamy (Tulane)
Neil S. Berman (Texas)
David H. Beyda (Loyola)*
Llewellyn W. Bezanson (Clarkson)
Roy D. Bloebaum (Western Australia)*
Veronica A. Burrows (Princeton)
Timothy S. Cale (Houston)
Ray W. Carpenter (UC/Berkeley)
William A. Coghlan (Stanford)
William J. Dorson (Cincinnati)
R. Leighton Fisk (Alberta)*
Eric J. Guilbeau (Louisiana Tech)
David E. Haskins (Oklahoma)*
Lester E. Hendrickson (Illinois)
Dean L. Jacobson (UCLA)
James B. Koeneman (Western Australia)*
Stephen J. Krause (Michigan)
James L. Kuester (Texas A&M)
Vincent B. Pizziconi (ASU)*
Gregory B. Raupp (Wisconsin)
Castle O. Reiser (Wisconsin)*
Vernon E. Sater (IIT)
Milton C. Shaw (Cincinnati)
Kwang S. Shin (Northwestern)
James T. Stanley (Illinois)
Robert S. Torrest (Minnesota)
Bruce C. Towe (Pennsylvania State)
Thomas L. Wachtel (St. Louis University)*
Bruce J. Wagner (Virginia)
Allan M. Weinstein (Brooklyn Polytech)*
Jack M. Winters (UC/Berkeley)
Imre Zwiebel (Yale)
*Adjunct or Emeritus Professor

Fellowships and teaching and research assistantships are available to qualified applicants.

ASU in Tempe, a city of 120,000, and is a part of the greater Phoenix metropolitan area. More than 40,000 students are enrolled in ASU's ten colleges; 10,000 are in graduate study. Arizona's year-round climate and scenic attractions add to ASU's own cultural and recreational facilities.

FOR INFORMATION, CONTACT:
Department of Chemical and Bio Engineering
Neil S. Berman, Graduate Program Coordinator
Arizona State University, Tempe, AZ 85287

GRADUATE STUDIES

CHEMICAL ENGINEERING

Auburn University

Auburn æ Engineering

THE FACULTY

R. T. K. BAKER (University of Wales, 1978)
R. P. CHAMBERS (University of California, 1965)
C. W. CURTIS (Florida State University, 1976)
J. A. GUIN (University of Texas, 1970)
L. J. HIRTH (University of Texas, 1958)
A. KRISHNAGOPALAN (University of Maine, 1976)
Y. Y. LEE (Iowa State University, 1972)
R. D. NEUMAN (Inst. Paper Chemistry, 1973)
T. D. PLACEK (University of Kentucky, 1978)
C. W. ROOS (Washington University, 1951)
A. R. TARRER (Purdue University, 1973)
B. J. TATARCHUK (University of Wisconsin, 1981)
D. L. VIVES (Columbia University, 1949)
D. C. WILLIAMS (Princeton University, 1980)

FOR INFORMATION AND APPLICATION, WRITE
Dr. R. P. Chambers, Head
Chemical Engineering
Auburn University, AL 36849

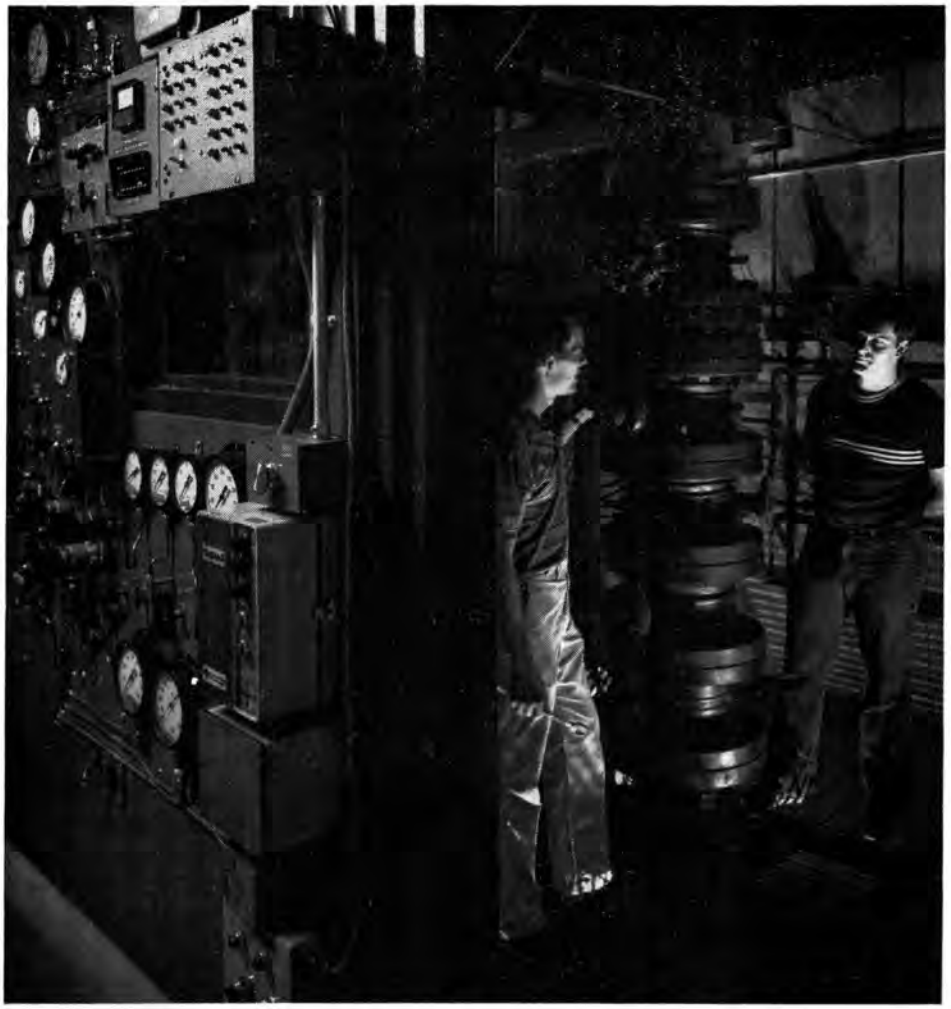
RESEARCH AREAS

Biomedical/Biochemical Engineering
Biomass Conversion
Carbon Fibers and Composites
Coal Conversion
Controlled Atmosphere
Electron Microscopy
Environmental Pollution
Heterogeneous Catalysis
Interfacial Phenomena
Microelectronics
Oil Processing
Process Design and Control
Process Simulation
Pulp and Paper Engineering
Reaction Engineering
Reaction Kinetics
Separations
Surface Science
Thermodynamics
Transport Phenomena

THE PROGRAM

The Department is one of the fastest growing in the Southeast and offers degrees at the M.S. and Ph.D. levels. Research emphasizes both experimental and theoretical work in areas of national interest, with modern research equipment available for most all types of studies. Generous financial assistance is available to qualified students.

Auburn University is an Equal Opportunity Educational Institution



Graduate Studies in Chemical Engineering at Brigham Young University, Provo, Utah

Programs of study leading to the M.E., M.S. and Ph.D. degrees on a beautiful campus located at the base of the Rocky Mountains.

Faculty

Dee Barker, *U. of Utah, 1951*
Calvin H. Bartholomew, *Stanford, 1972*
Merrill W. Beckstead, *U. of Utah, 1965*
Douglas N. Bennion, *Berkeley, 1964*
B. Scott Brewster, *U. of Utah, 1979*
James J. Christensen, *Carnegie Mellon, 1957*
Richard W. Hanks, *U. of Utah, 1960*
William C. Hecker, *Berkeley, 1982*
Paul O. Hedman, *BYU, 1973*
John L. Oscarson, *U. of Michigan, 1982*
Richard L. Rowley, *Michigan State, 1978*
Philip J. Smith, *BYU, 1979*
L. Douglas Smoot, *U. of Washington, 1960*
Kenneth A. Solen, *U. of Wisconsin, 1974*

For additional information and application, write:

Graduate Coordinator
Department of Chemical Engineering
350 CB
Brigham Young University
Provo, Utah 84602

Research Areas

Thermodynamics
Transport Phenomena
Calorimetry
Computer Simulation
Coal Combustion and Gasification
Kinetics and Catalysis
Biomedical Engineering
Fluid Mechanics
Chemical Propulsion
Mathematical Modeling
Electrochemistry
Membrane Transport
Nonequilibrium Thermodynamics
Process Design and Control

THE UNIVERSITY OF CALGARY

The University is located in the City of Calgary, the oil capital of Canada, the home of the world famous Calgary Stampede and the 1988 Winter Olympics. The city combines the traditions of the Old West with the sophistication of a modern urban centre. Beautiful Banff National Park is 110 km west of the City and the ski resorts of the Banff, Lake Louise and Kananaskis areas are readily accessible.

FOR ADDITIONAL INFORMATION WRITE

Dr. P. R. Bishnoi, Crairman
Graduate Studies Committee
Dept. of Chemical & Petroleum Eng.
The University of Calgary
Calgary, Alberta T2N 1N4 Canada

GRADUATE STUDIES IN CHEMICAL AND PETROLEUM ENGINEERING

The Department offers programs leading to the M.Sc. and Ph.D. degrees (full-time) and the M. Eng. degree (part-time) in the following areas:

- **Thermodynamics—Phase Equilibria**
- **Heat Transfer and Cryogenics**
- **Catalysis, Reaction Kinetics and Combustion**
- **Multiphase Flow in Pipelines**
- **Fluid Bed Reaction Systems**
- **Environmental Engineering**
- **Petroleum Engineering and Reservoir Simulation**
- **Enhanced Oil Recovery**
- **In-Situ Recovery of Bitumen and Heavy Oils**
- **Natural Gas Processing and Gas Hydrates**
- **Computer Simulation of Separation Processes**
- **Computer Control and Optimization of Engineering and Bio Processes**
- **Biotechnology and Biorheology**

Fellowships and Research Assistantships are available to qualified applicants.

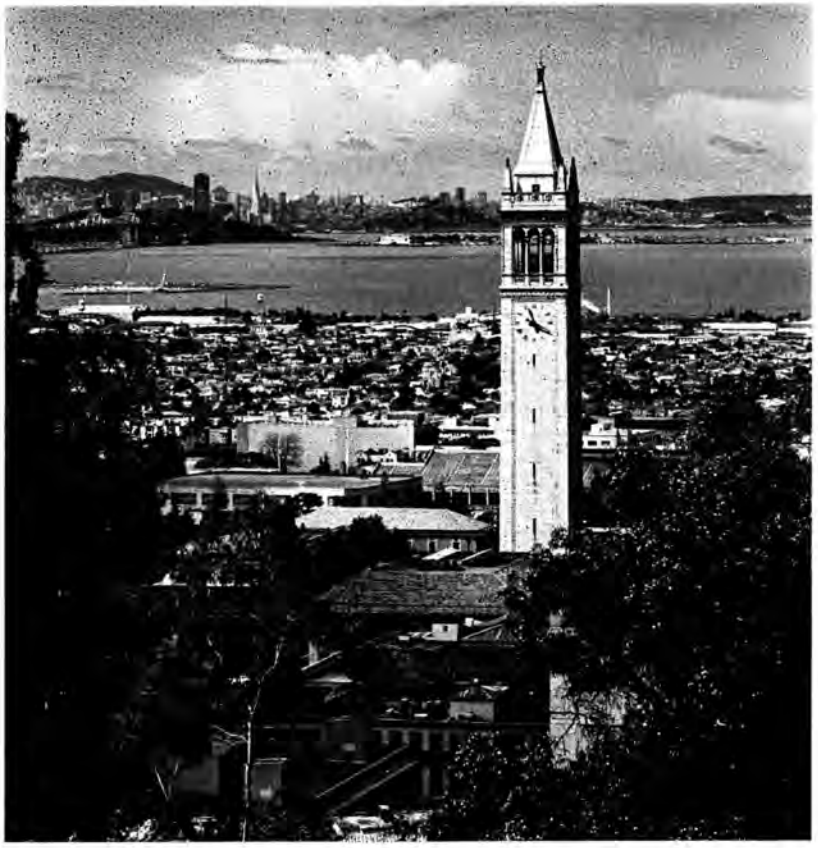
FACULTY

R. A. HEIDEMANN,* Head	(Wash. U.)
A. BADAKHSHAN	(Birm. U.K.)
L. A. BEHIE	(W. Ont.)
D. W. B. BENNION	(Penn. State)
F. BERRUTI	(Waterloo)
P. R. BISHNOI	(Alberta)
R. M. BUTLER	(Imp. Coll. U.K.)
M. FOGARASI	(Alberta)
M. A. HASTAOGLU	(SUNY)
J. HAVLENA	(Czech.)
A. A. JEJE*	(MIT)
N. E. KALOGERAKIS	(Toronto)
A. K. MEHROTRA	(Calgary)
M. F. MOHTADI	(Birm. U.K.)
R. G. MOORE**	(Alberta)
P. M. SIGMUND	(Texas)
J. STANISLAV	(Prague)
W. Y. SVRCEK	(Alberta)
E. L. TOLLEFSON	(Toronto)
M. A. TREBBLE	(Calgary)

*On sabbatical leave during the 1986-87 academic year.
**Acting Head.

THE UNIVERSITY OF CALIFORNIA,

BERKELEY. . .



. . . offers graduate programs leading to the Master of Science and Doctor of Philosophy. Both programs involve joint faculty-student research as well as courses and seminars within and outside the department. Students have the opportunity to take part in the many cultural offerings of the San Francisco Bay Area, and the recreational activities of California's northern coast and mountains.

RESEARCH INTERESTS

ENERGY UTILIZATION
ENVIRONMENTAL PROTECTION
KINETICS AND CATALYSIS
THERMODYNAMICS
POLYMER TECHNOLOGY
ELECTROCHEMICAL ENGINEERING
PROCESS DESIGN AND DEVELOPMENT
SURFACE AND COLLOID SCIENCE
BIOCHEMICAL ENGINEERING
SEPARATION PROCESSES
FLUID MECHANICS AND RHEOLOGY
ELECTRONIC MATERIALS PROCESSING

FACULTY

Alexis T. Bell (Chairman)
Harvey W. Blanch
Elton J. Cairns
Douglas S. Clark
Morton M. Denn
Alan S. Foss
Simon L. Goren
David B. Graves
Edward A. Grens
Donald N. Hanson
Dennis W. Hess
C. Judson King
Scott Lynn
James N. Michaels
John S. Newman
Eugene E. Petersen
John M. Prausnitz
Clayton J. Radke
Jeffrey A. Reimer
David S. Soong
Doros N. Theodorou
Charles W. Tobias
Charles R. Wilke
Michael C. Williams

PLEASE WRITE: **Department of Chemical Engineering**
UNIVERSITY OF CALIFORNIA
Berkeley, California 94720

UNIVERSITY OF CALIFORNIA
DAVIS

Course Areas

Applied Kinetics and Reactor Design
Applied Mathematics
Biotechnology
Colloid and Interface Processes
Fluid Mechanics
Heat Transfer
Mass Transfer
Process Control
Process Design
Rheology
Semiconductor Device Fabrication
Separation Processes
Thermodynamics
Transport Processes in Porous Media

Program

UC Davis, with 19,000 students, is one of the major campuses of the University of California system and has developed great strength in many areas of the biological and physical sciences. The Department of Chemical Engineering emphasizes research and a program of fundamental graduate courses in a wide variety of fields of interest to chemical engineers. In addition, the department can draw upon the expertise of faculty in other areas in order to design individual programs to meet the specific interests and needs of a student, even at the M.S. level. This is done routinely in the areas of environmental engineering, food engineering, biochemical engineering, electrical and computer engineering.

Excellent laboratories, computation center and electronic and mechanical shop facilities are available. Fellowships, Teaching Assistantships and Research Assistantships (all providing additional summer support if desired) are available to qualified applicants.

Degrees Offered

Master of Science
Doctor of Philosophy

Faculty and Research Areas

RICHARD L. BELL, University of Washington
Mass Transfer, Biomedical Applications
ROGER B. BOULTON, University of Melbourne
Enology, Fermentation, Filtration, Process Control
BRIAN G. HIGGINS, University of Minnesota
Fluid Mechanics of Thin Film Coating, Interfacial Phenomena
ALAN P. JACKMAN, University of Minnesota
Environmental Engineering, Transport Phenomena
BEN J. McCOY, University of Minnesota
Separation and Transport Processes, Kinetics
KAREN A. McDONALD, University of Maryland
Process Control, Biochemical Engineering
AHMET N. PALAZOGLU,, Rensselaer Polytechnic Institute
Process Design and Process Control
ROBERT L. POWELL, The Johns Hopkins University
Rheology, Fluid Mechanics, Aucoustics, Hazardous Waste
DEWEY D. Y. RYU, Massachusetts Inst. of Technology
Biochemical Engineering, Fermentation
JOE M. SMITH, Massachusetts Institute of Technology
Applied Kinetics and Reactor Design
PIETER STROEVE, Massachusetts Institute of Technology
Mass Transfer, Colloids, Biotechnology, Thin Film Technology
STEPHEN WHITAKER, University of Delaware
Fluid Mechanics, Interfacial Phenomena, Transport Processes in Porous Media

Davis and Vicinity

The campus is a 20-minute drive from Sacramento and just over an hour away from the San Francisco Bay area. Outdoor sports enthusiasts can enjoy water sports at nearby Lake Berryessa, skiing and other alpine activities in the Sierra (2 hours from Davis). These recreational opportunities combine with the friendly informal spirit of the Davis campus to make it a pleasant place in which to live and study.

Married student housing, at reasonable cost, is located on campus. Both furnished and unfurnished one- and two-bedroom apartments are available. The town of Davis (population 36,000) is adjacent to the campus, and within easy walking or cycling distance.

For further details on graduate study at Davis, please write to:

Professor Pieter Stroeve
Chemical Engineering Department
University of California
Davis, California 95616
or call (916) 752-0400

CHEMICAL ENGINEERING

UNIVERSITY OF CALIFORNIA LOS ANGELES

PROGRAMS

UCLA's Chemical Engineering Department maintains academic excellence in its graduate programs by offering diversity in both curriculum and research opportunities. The department's continual growth is demonstrated by the newly established Institute for Medical Engineering and the National Center for Intermedia Transport Research, adding to the already wide spectrum of research activities.

Fellowships are available for outstanding applicants. A fellowship includes a waiver of tuition and fees plus a stipend.

Located five miles from the Pacific Coast, UCLA's expansive 417 acre campus extends from Bel Air to Westwood Village. Students have access to the highly regarded sciences programs and to a variety of experiences in theatre, music, art and sports on campus.

CONTACT

Admissions Officer
Chemical Engineering Department
5531 Boelter Hall
UCLA
Los Angeles, Ca 90024

FACULTY

D.T. Allen
Yoram Cohen
T.H.K. Frederking
S.K. Friedlander
Robert F. Hicks
E.L. Knuth
V. Manousiouthakis
Ken Nobe
L.B. Robinson
O.I. Smith
W.D. Van Vorst
V.L. Vilker
A.R. Wazzan
F.E. Yates

RESEARCH AREAS

Thermodynamics and Cryogenics
Reverse Osmosis and Membrane Transport
Process Design and Systems Analysis
Polymer Processing and Rheology
Mass Transfer and Fluid Mechanics
Kinetics, Combustion and Catalysis
Electrochemistry and Corrosion
Biochemical and Biomedical Engineering
Aerosol and Environmental Engineering

UNIVERSITY OF CALIFORNIA
SANTA BARBARA

FACULTY AND RESEARCH INTERESTS

SANJOY BANERJEE Ph.D. (Waterloo) (Chairman)
Two-Phase Flow, Chemical & Nuclear Safety, Computational Fluid Dynamics, Turbulence.

PRAMOD AGRAWAL Ph.D. (Purdue)
Biochemical Engineering, Fermentation Science

HENRI FENECH Ph.D. (M.I.T.)
Nuclear Systems Design and Safety, Nuclear Fuel Cycles, Two-Phase Flow, Heat Transfer.

OWEN T. HANNA Ph.D. (Purdue)
Theoretical Methods, Chemical Reactor Analysis, Transport Phenomena.

SHINICHI ICHIKAWA Ph.D. (Stanford)
Adsorption and Heterogeneous Catalysis

JACOB ISRAELACHVILI Ph.D. (Cambridge)
Surface and Interfacial Phenomenon, Adhesion, Colloidal Systems, Surface Forces.

GLENN E. LUCAS Ph.D. (M.I.T.)
Radiation Damage, Mechanics of Materials.

DUNCAN A. MELLICHAMP Ph.D. (Purdue)
Computer Control, Process Dynamics, Real-Time Computing.

JOHN E. MYERS Ph.D. (Michigan)
Boiling Heat Transfer.

G. ROBERT ODETTE Ph.D. (M.I.T.)
Radiation Effects in Solids, Energy Related Materials Development.

PHILIP ALAN PINCUS Ph.D. (U.C. Berkeley)
Theory of Surfactant Aggregates, Colloid Systems.

A. EDWARD PROFIO Ph.D. (M.I.T.)
Bionuclear Engineering, Fusion Reactors, Radiation Transport Analyses.

ROBERT G. RINKER Ph.D. (Caltech)
Chemical Reactor Design, Catalysis, Energy Conversion, Air Pollution.

ORVILLE C. SANDALL Ph.D. (U.C. Berkeley) (Vice Chairman)
Transport Phenomena, Separation Processes.

DALE E. SEBORG Ph.D. (Princeton)
Process Control, Computer Control, Process Identification.

T. G. THEOFANOUS Ph.D. (Minnesota)
Nuclear and Chemical Plant Safety, Multiphase Flow, Thermalhydraulics.

JOSEPH A. N. ZASADZINSKI Ph.D. (Minnesota)
Surface and Interfacial Phenomenon, Structure of Microemulsions.

PROGRAMS AND FINANCIAL SUPPORT

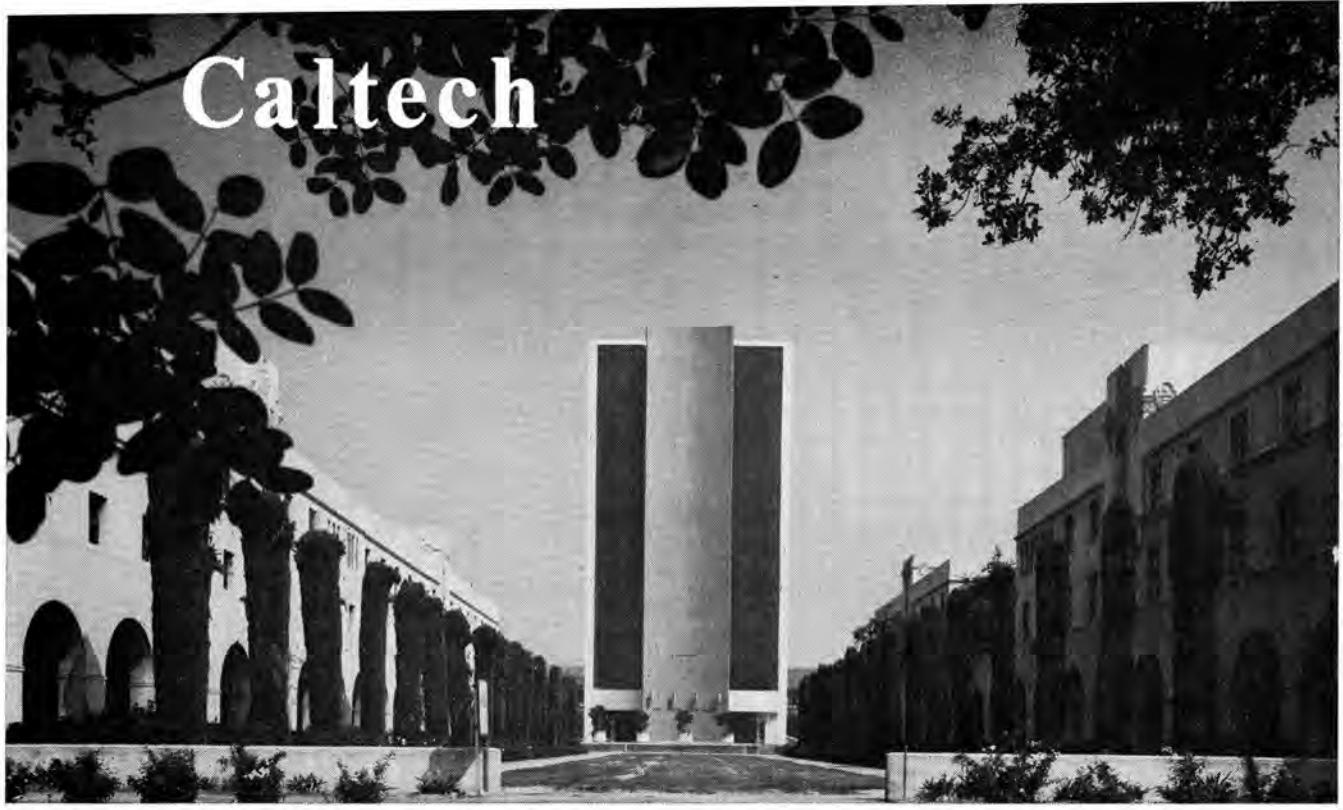
The Department offers M.S. and Ph.D. degree programs. Financial aid, including fellowships, teaching assistantships, and research assistantships, is available. Some awards provide limited moving expenses.

THE UNIVERSITY

One of the world's few seashore campuses, UCSB is located on the Pacific Coast 100 miles northwest of Los Angeles and 330 miles south of San Francisco. The student enrollment is over 16,000. The metropolitan Santa Barbara area has over 150,000 residents and is famous for its mild, even climate.

For additional information and applications, write to:

Professor Sanjoy Banerjee, Chairman
Department of Chemical & Nuclear Engineering
University of California,
Santa Barbara, CA 93106



PROGRAM OF STUDY Distinctive features of study in chemical engineering at the California Institute of Technology are the creative research atmosphere and the strong emphasis on basic chemical, physical, and mathematical disciplines in the program of study. In this way a student can properly prepare for a productive career of research, development, or teaching in a rapidly changing and expanding tchnological society.

A course of study is selected in consultation with one or more of the faculty listed below. Required courses are minimal. The Master of Science degree is normally completed in one calendar year and a thesis is not required. A special M.S. option, involving either research or an integrated design project, is a feature of the overall program of graduate study. The Ph.D. degree requires a minimum of three years subsequent to the B.S. degree, consisting of thesis research and further advanced study.

FINANCIAL ASSISTANCE Graduate students are supported by fellowship, research assistantship, or teaching assistantship appointments during both the academic year and the summer months. A student may carry a full load of graduate study and research in addition to any assigned assistantship duties. The Institute gives consideration for admission and financial assistance to all qualified applicants regardless of race, religion, or sex.

APPLICATIONS Further information and an application form may be obtained by writing

Professor L. Gary Leal
Chemical Engineering
California Institute of Technology
Pasadena, California 91125

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JAMES E. BAILEY, Professor
Ph.D. (1969), Rice University
Biochemical engineering; chemical reaction engineering.

JOHN F. BRADY, Associate Professor
PhD. (1981), Stanford University
Fluid mechanics; transport properties of heterogeneous systems

GEORGE R. GAVALAS, Professor
Ph.D. (1964), University of Minnesota
Applied kinetics and catalysis; coal gasificatfon

L. GARY LEAL, Chevron Professor
Ph.D. (1969), Stanford University
Theoretical and experimental fluid mechanics; heat and mass transfer; suspension rheology; mechanics of non-Newtonian fluids.

MANFRED MORARI, Professor
Ph.D. (1977), University of Minnesota
Process control; process design

C. DWIGHT PRATER, Visiting Associate
Ph.D. (1951), University of Pennsylvania
Catalysis; chemical reaction engineering; process design and development.

JOHN H. SEINFELD, Louis E. Nohl Professor, Executive Officer
Ph.D. (1967), Princeton University
Air pollution; control and estimation theory.

FRED H. SHAIR, Professor
Ph.D. (1963), University of California, Berkeley
Plasma chemistry and physics; tracer studies of various environmental and safety related problems.

NICHOLAS W. TSCHOEGL, Professor Emeritus
Ph.D. (1958), University of New South Wales
Mechanical properties of polymeric materials; theory of viscoelastic behavior; structure-property relations in polymers.

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Surface chemistry and catalysis.

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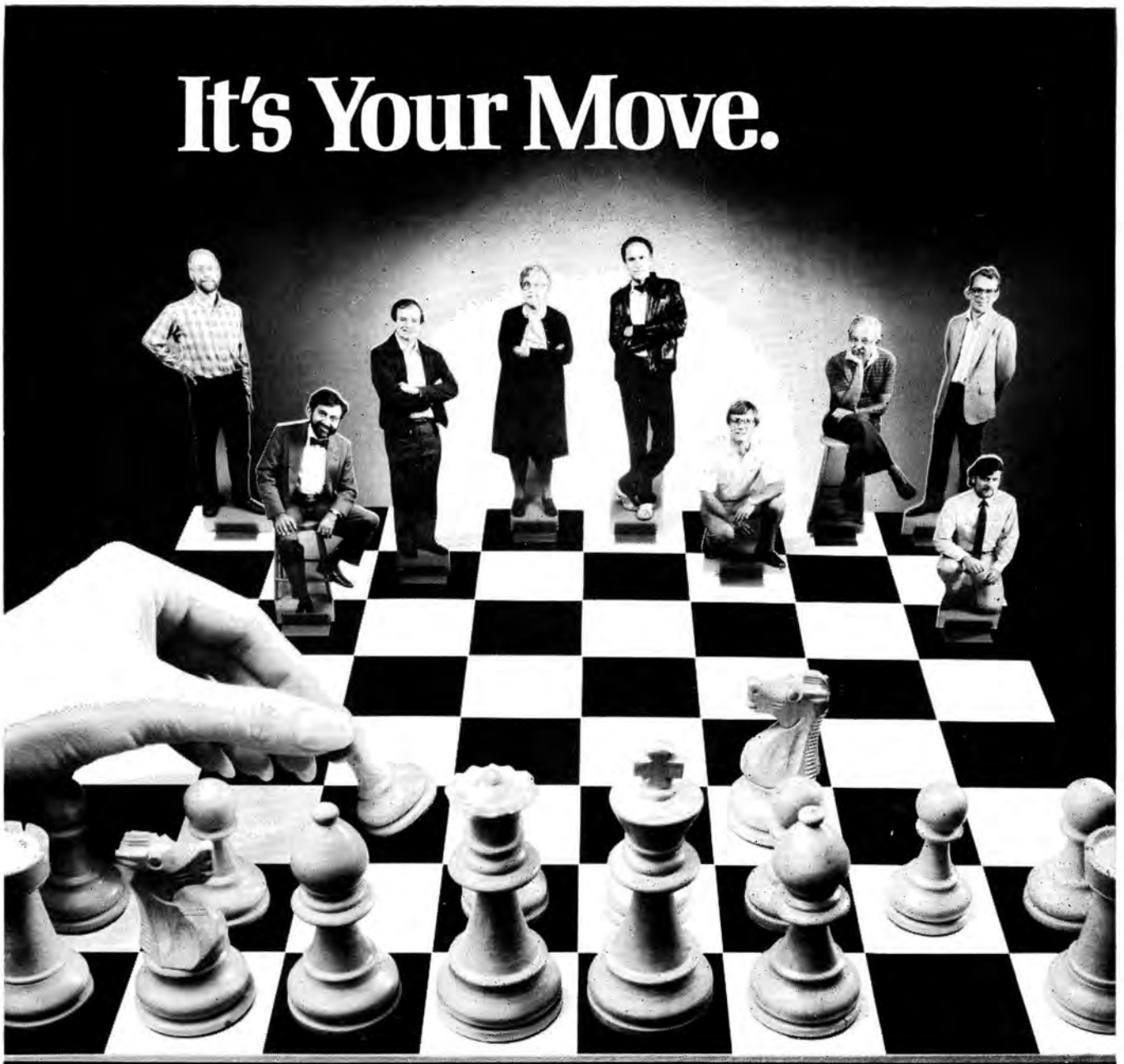

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Particle separations, mixing, acid gas recovery

John C. Angus, Ph.D. 1960, University of Michigan
Redox equilibria, thin carbon films, modulated electroplating

Coleman B. Brosilow, Ph.D. 1962, Polytechnic Institute of Brooklyn
Adaptive inferential control, multivariable control, coordination algorithms

Robert V. Edwards, Ph.D. 1968, Johns Hopkins University
Laser anemometry, mathematical modelling, data acquisition

Donald L. Feke, Ph.D. 1981, Princeton University
Colloidal phenomena, ceramic dispersions, fine-particle processing

Nelson C. Gardner, Ph.D. 1966, Iowa State University
High-gravity separations, sulfur removal processes

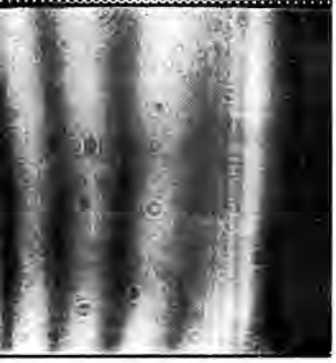
Uziel Landau, Ph.D. 1975, University of California (Berkeley)
Electrochemical engineering, current distributions, electrodeposition

Chung-Chiun Liu, Ph.D. 1968, Case Western Reserve University
Electrochemical sensors, electrochemical synthesis, electrochemistry related to electronic materials

J. Adin Mann, Jr., Ph.D. 1968, Iowa State University
Surface phenomena, interfacial dynamics, light scattering

Syed Qutubuddin, Ph.D. 1983, Carnegie-Mellon University
Surfactant systems, metal extraction, enhanced oil recovery

Robert F. Savinell, Ph.D. 1977, University of Pittsburgh, Electrochemical engineering, reactor design, and simulation; electrode processes



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Ph.D. (1975), University of Colorado
Fluidization, Process Control

ROBERT H. DAVIS, Assistant Professor
Ph.D. (1983), Stanford University
Fluid Dynamics of Suspensions, Biotechnology

JOHN L. FALCONER, Professor
Ph.D. (1974), Stanford University
Heterogeneous Catalysis, Surface Science

R. IGOR GAMOW, Associate Professor
Ph.D. (1967), University of Colorado
Biophysics, Bioengineering

PAUL G. GLUGLA, Assistant Professor
Ph.D. (1977), University of Illinois
Ionic Solutions, Thermodynamics, Membrane Separations

R. CURTIS JOHNSON, Professor
Ph.D. (1951), Pennsylvania State University
Global Modeling

DHINAKAR S. KOMPALA, Assistant Professor
Ph.D. (1984), Purdue University
Biochemical Engineering, Biotechnology, Mathematical Modeling

WILLIAM B. KRANTZ, Professor
Ph.D. (1968), University of California, Berkeley
Membranes, Geophysical Fluid Mechanics, Coal Gasification, Transport Processes in Permafrost

LEE L. LAUDERBACK, Assistant Professor
Ph.D. (1982), Purdue University
Surface Science, Heterogeneous Catalysis, Molecular Dynamics

MAX S. PETERS, Professor
Ph.D. (1951), Pennsylvania State University
Biomass Conversion, Economics

W. FRED RAMIREZ, Professor
Ph.D. (1965), Tulane University
Optimal Control and Identification, Transport in Porous Media

ROBERT L. SANI, Professor
Ph.D. (1963), University of Minnesota
Numerical Techniques in Fluid Dynamics, Membranes

KLAUS D. TIMMERHAUS, Chairman and **James M.** and **Catherine T. Patten** Professor
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E. D. Sloan, Jr., Professor; Ph.D., Clemson. Phase equiplibrium measurements of natural gas fluids and hydrates, thermal conductivity of coal derived fluids, adsorption equilibria, stagewise processes, education methods research.

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A. L. Bunge, Associate Professor; Ph.D., Berkeley. Membrane transport and separations, mass transfer in porous media, ion exchange and adsorption chromatography.

P. F. Bryan, Assistant Professor; Ph.D., Berkeley. Computer aided process design, computational thermodynamics.

A. D. Shine, Assistant Professor; Ph.D., MIT. Polymer rheology and processing, composites.

R. L. Miller, Research Assistant Professor, Ph.D. Colorado School of Mines, Liquefaction co-processing of coal and heavy oil, low severity coal liquefaction, oil shale processing, particulate removal with venturi scrubbers, multiphase fluid mechanics.

J. F. Ely, Adjunct Professor; Ph.D., Indiana. Molecular thermodynamics and transport properties of fluids.

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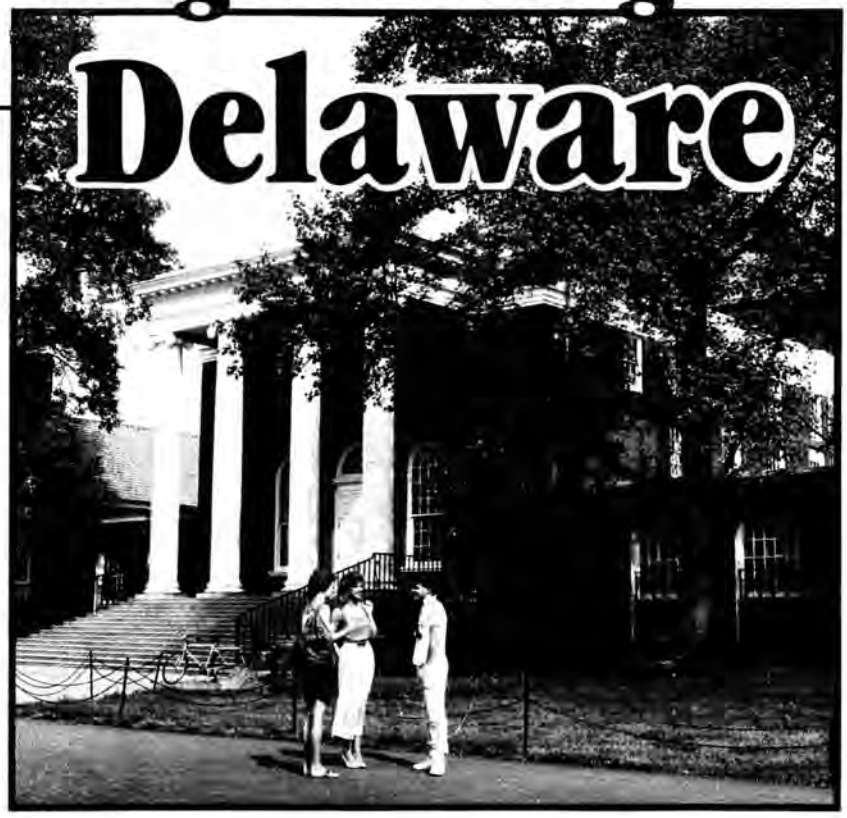

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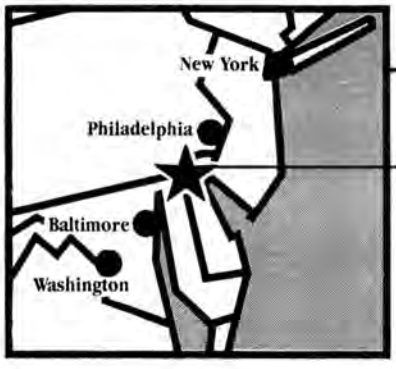

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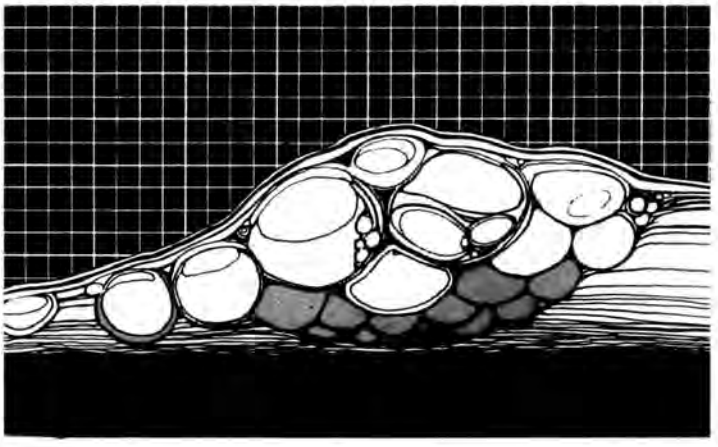

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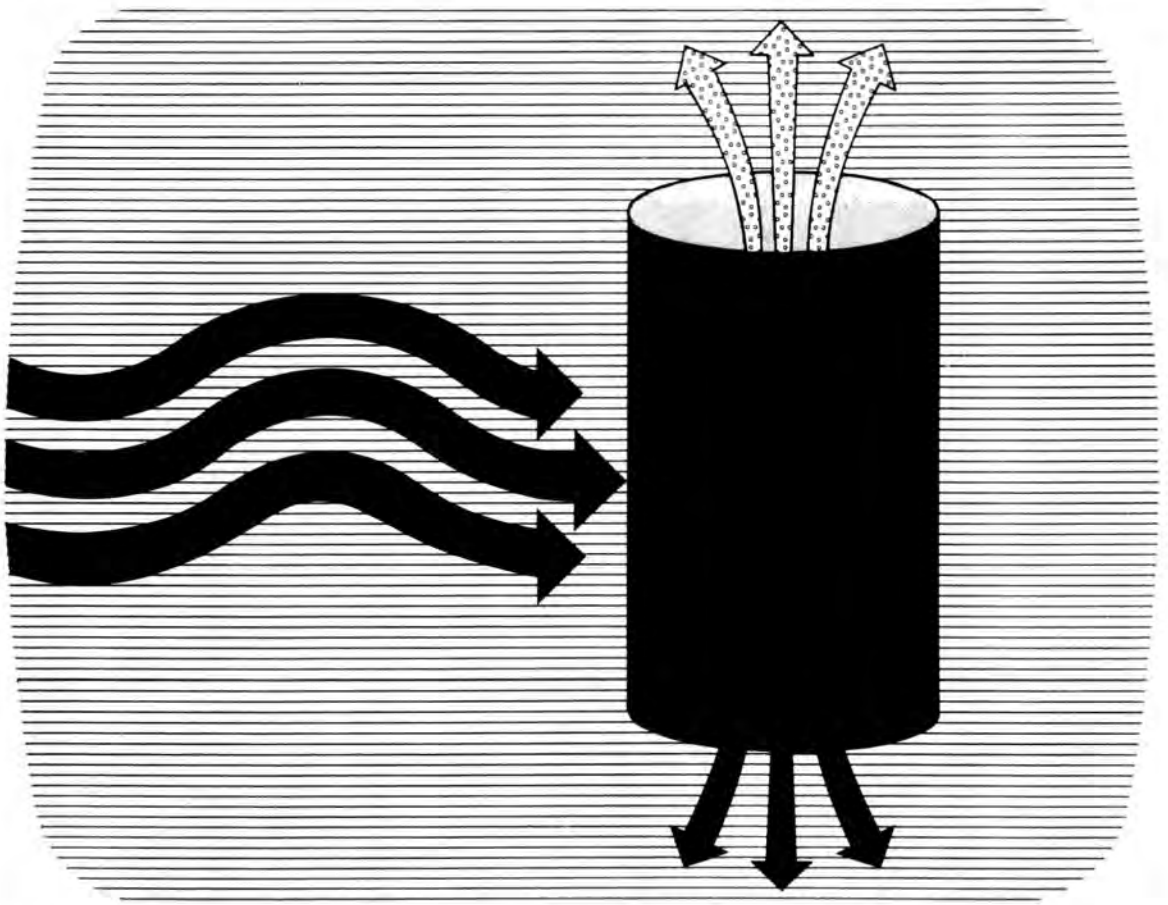

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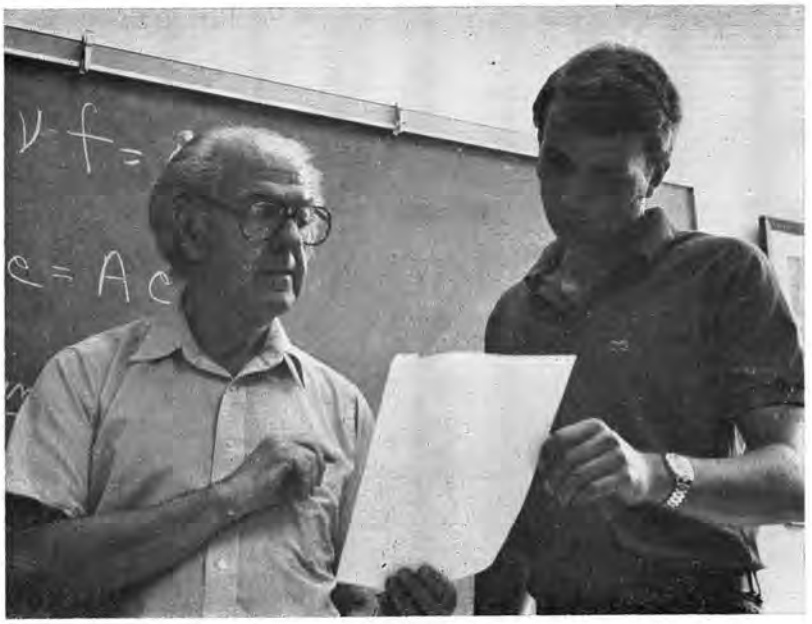

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T. S. Jiang PhD., Northwestern University, 1981 Assistant Professor	Interfacial Phenomena, multiphase flows, flow through porous media, suspension rheology
John H. Kiefer Ph.D., Cornell University, 1961 Professor	Kinetics of gas reactions, energy transfer processes, laser diagnostics
G. Ali Mansoori Ph.D., University of Oklahoma, 1969 Professor	Thermodynamics and statistical mechanics of fluids solids, and solutions, kinetics of liquid reactions, solar energy.
Sohail Murad Ph.D., Cornell University, 1979 Assistant Professor	Thermodynamics and transport properties of fluids, computer simulation and statistical mechanics of liquids and liquid mixtures
Satish C. Saxena Ph.D., Calcutta University, 1956 Professor	Transport properties of fluids and solids, heat and mass transfer, isotope separation, fixed and fluidized bed combustion,and indirect coal liquefaction
Stephen Szepe Ph.D., Illinois Institute of Technology, 1966 Associate Professor	Catalysis, chemical reaction engineering, energy transmission, modeling and optimization
Raffi M. Turian Ph.D., University of Wisconsin, 1964 Professor	Slurry transport, suspension and complex fluid flow and heat transfer, porous media processes, mathematical analysis and approximation.
Irving F. Miller Ph.D., University of Michigan Professor and Head	Lipid microencapsulation; Adorption and surface reactions; Membrane transport. Synthesis of blood
Joachim Floess Ph.D., Massachsetts Inst. of Tech., 1985 Assistant Professor	Reaction engineering with primary focus on the pyrolysis of oil shale and coal. Energy technology, environmental controls.
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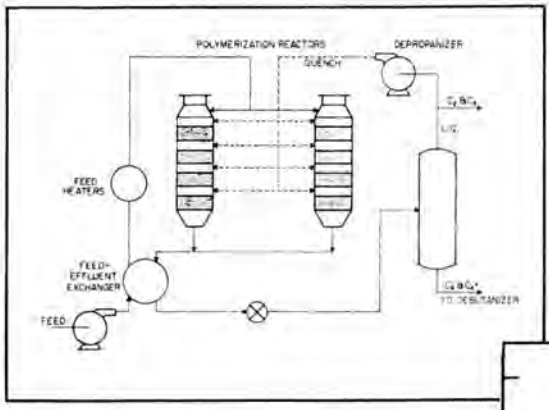

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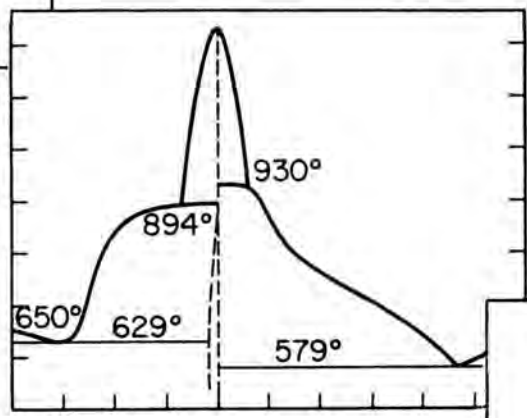

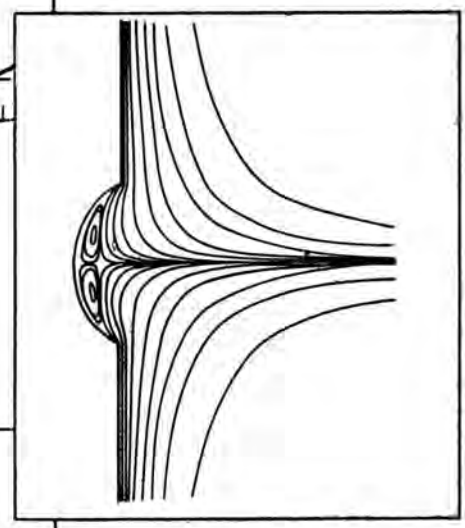

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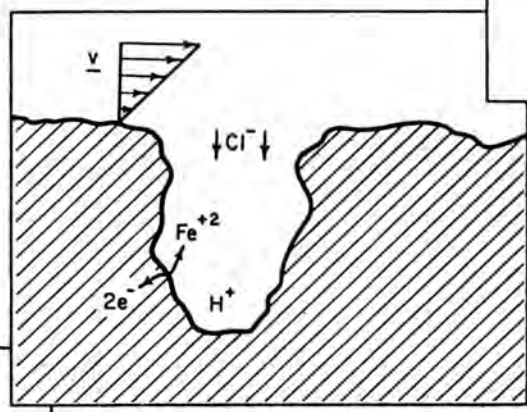

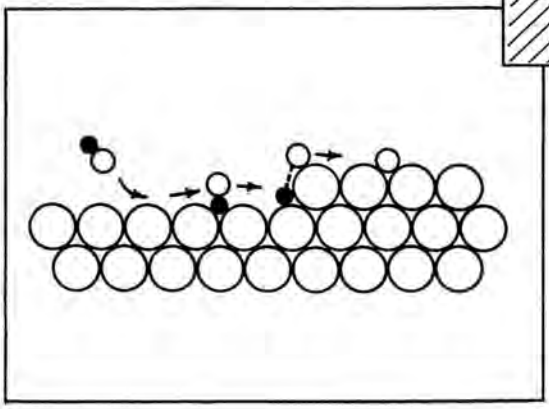

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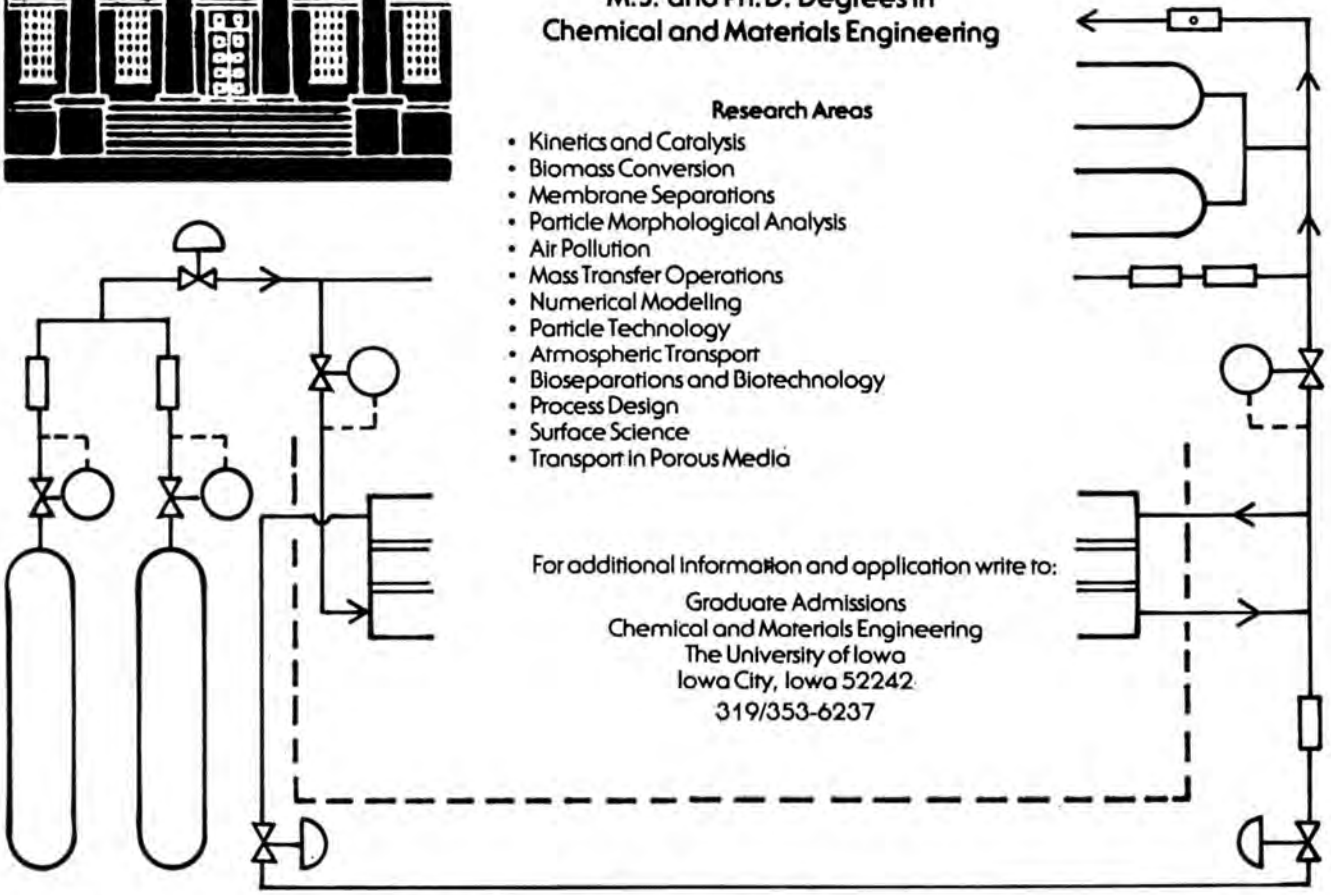

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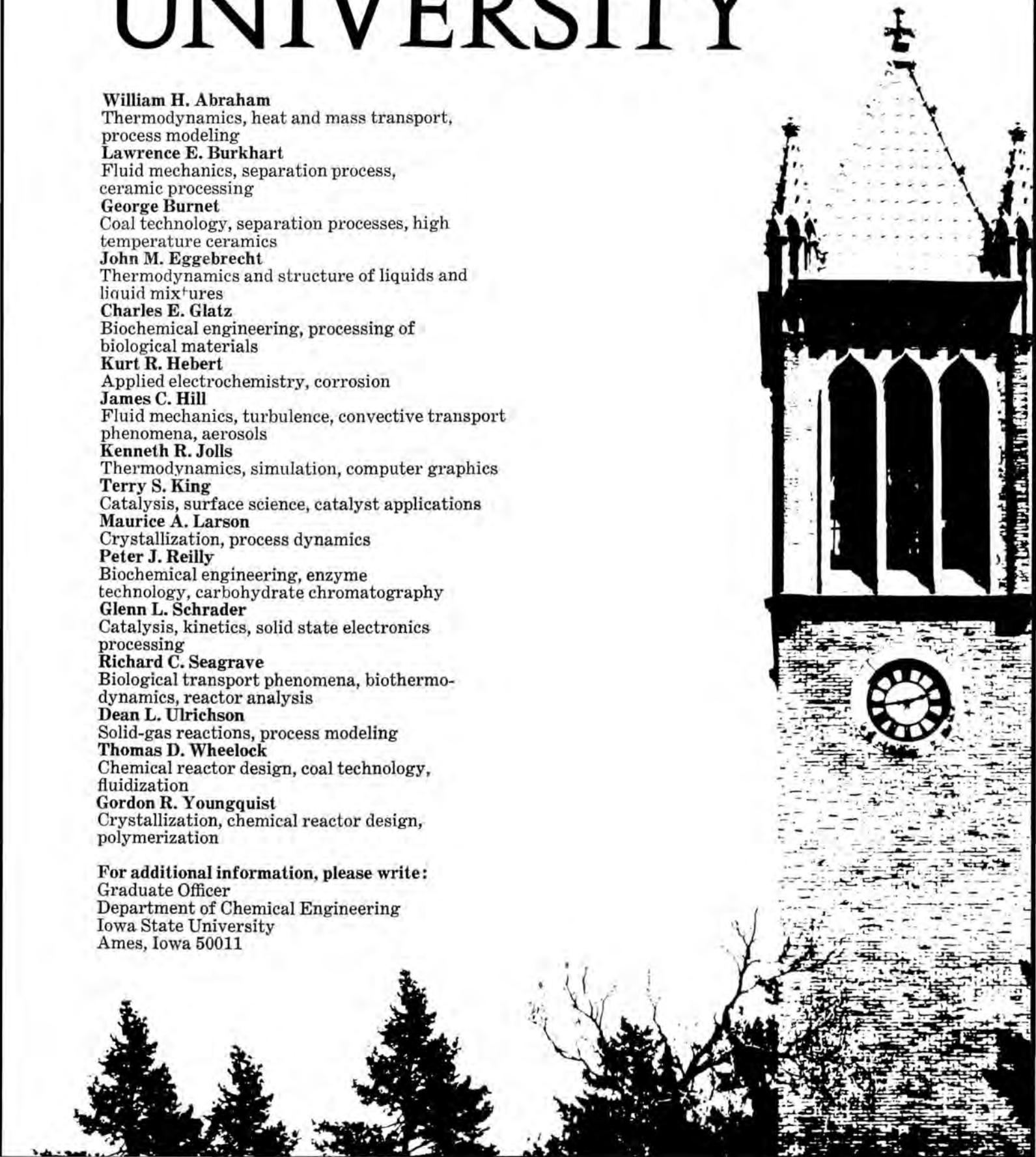
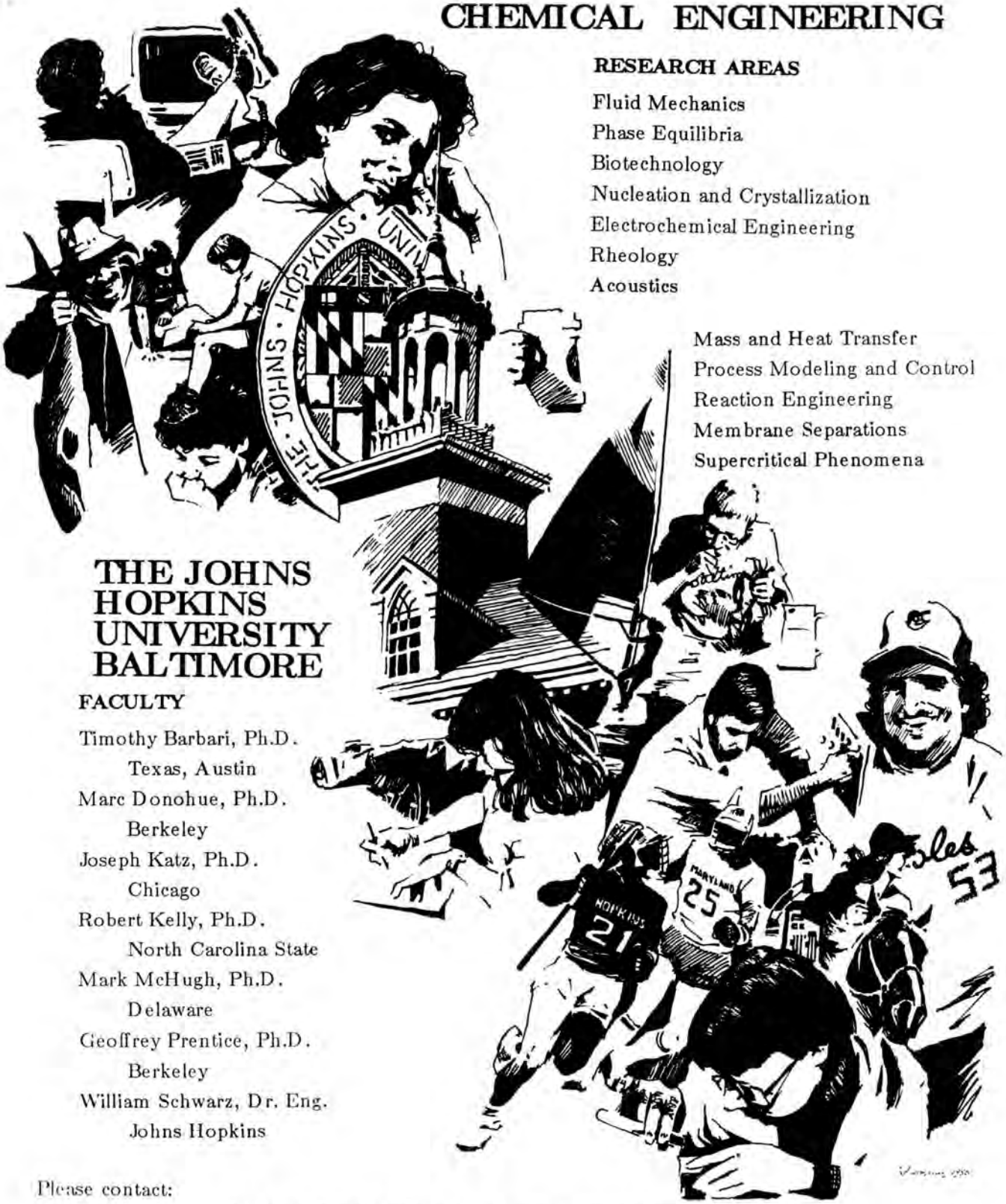
Iowa State University
Ames, Iowa 50011



CHEMICAL ENGINEERING



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Please contact:

Professor Geoffrey Prentice, Department of Chemical Engineering
The Johns Hopkins University, Baltimore, Maryland 21218
Telephone: (301) 338-7006

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Chairman and Graduate Advisor
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The University of Kansas
Lawrence, Kansas 66045-2223

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James O. Maloney, Professor Emeritus (Ph.D., Penn State); technology and society

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Bala Subramaniam, Assistant Professor (Ph.D., Notre Dame); kinetics and catalysis, insitu characterization of catalyst systems

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John L. Thiele, Assistant Professor (Sc.D., MIT); structure/property relationships of polymers, polymer chemistry and physics, polymer viscoelasticity

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Chemical Engineering Department
University of Kentucky
Lexington, Kentucky 40506-0046

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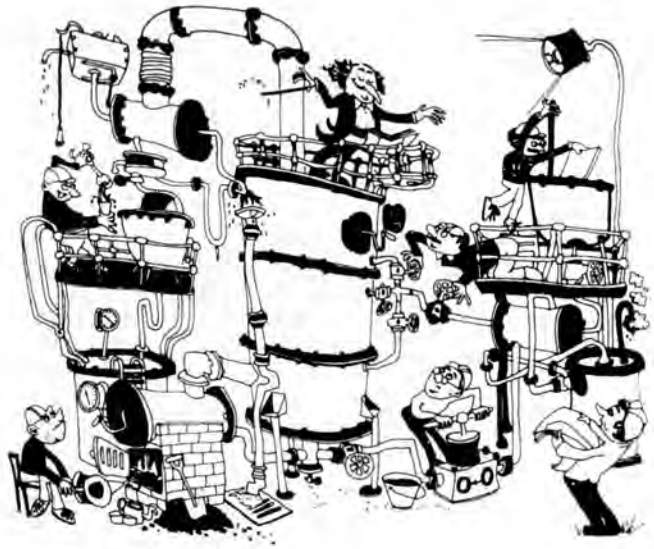

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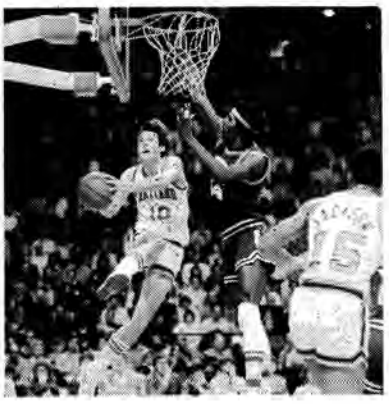

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Prof. M. F. Doherty
Graduate Program Director
Dept. of Chemical Engineering
University of Massachusetts
Amherst, Mass. 01003

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Photo by James Wei

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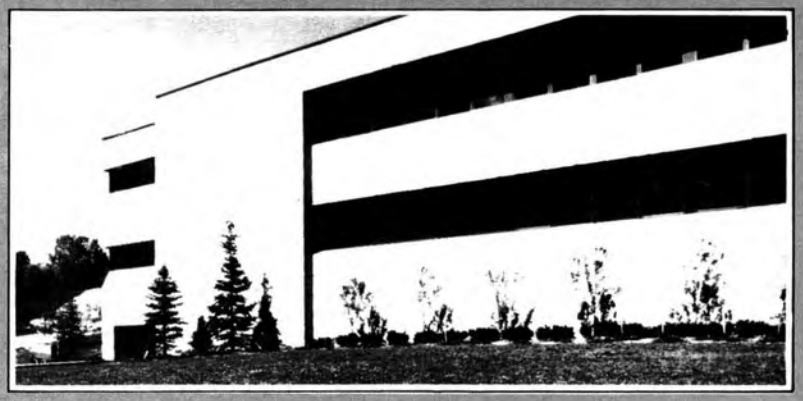

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Ph.D., 1975, Ohio State University
Mass Transport Phenomena, Polymer Devolatilization, Biochemical Engineering, Food Engineering

M. C. HAWLEY
Ph.D., 1964, Michigan State University
Kinetics, Catalysis, Reactions in Plasmas, Polymerization Reactions, Composite Processing, Reaction Engineering

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Ph.D., 1975, Princeton University
Polymer Rheology, Melt Blending of Polymers, Applied Acoustics

C. T. LIRA
Ph.D., 1985, University of Illinois at Urbana-Champaign
Thermodynamics and Phase Equilibria of Complex Systems, Supercritical Fluid Studies

D. J. MILLER
Ph.D., 1982, University of Florida
Kinetics and Catalysis, Carbon Gasification, Thermal and Chemical Conversion of Biomass

C. A. PETTY
Ph.D., 1970, University of Florida
Fluid Mechanics, Turbulent Transport Phenomena, Solid-Fluid Separations

B. W. WILKINSON
Ph.D., 1958, Ohio State University
Energy Systems and Environmental Control, Nuclear Reactor, Radioisotope Applications

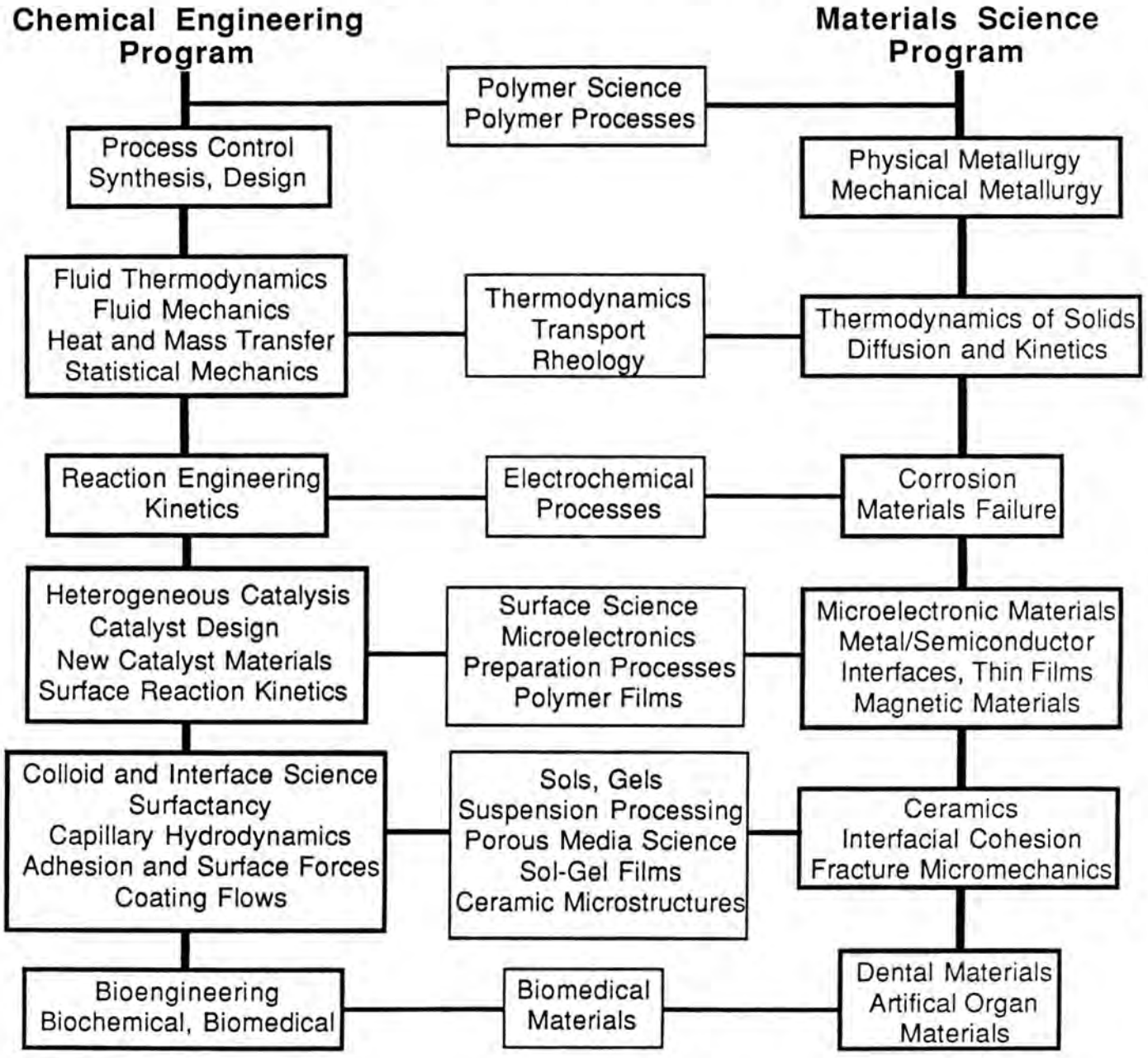
R. M. WORDEN
Ph.D., 1986, University of Tennessee
Biochemical Engineering, Immobilized Cell Technology, Bioreactor Dynamics and Control

FOR ADDITIONAL INFORMATION WRITE

Dr. Dennis J. Miller, Coordinator of Graduate Recruiting
Department of Chemical Engineering, 173 Engineering Building
Michigan State University
East Lansing, Michigan 48824-1226

University of Minnesota

Chemical Engineering and Materials Science



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Department of Chemical Engineering

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Contact Dr. J. W. Johnson, Chairman

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FACULTY AND RESEARCH INTERESTS

N. L. BOOK (Ph.D., Colorado)—Computer Aided Process Design, Bioconversion.

O. K. CROSSER (Ph.D., Rice)—Transport Properties, Kinetics, Catalysis.

M. E. FINDLEY (Ph.D., Florida)—Biochemical Studies, Biomass Utilization

J.-C. HAJDUK (Ph.D. Illinois-Chicago)—Chemical kinetics, Statistical and Non-equilibrium Thermodynamics.

J. W. JOHNSON (Ph.D., Missouri)—Electrode Reactions, Corrosion.

A. I. LIAPIS (Ph.D., ETH-Zurich)—Adsorption, Freeze Drying, Modeling, Optimization, Reactor Design.

J. M. D. MAC ELROY (Ph.D., University College Dublin)—Transport Phenomena, Heterogeneous Catalysis, Drying, Statistical Mechanics.

D. B. MANLEY (Ph.D., Kansas)—Thermodynamics, Vapor-Liquid Equilibrium.

P. NEOGI (Ph.D., Carnegie-Mellon)—Interfacial Phenomena

B. E. POLING (Ph.D., Illinois)—Kinetcis, Energy Storage, Catalysis.

X. B. REED, JR. (Ph.D., Minnesota)—Fluid Mechanics, Drop Mechanics, Coalescence Phenomena, Liquid-Liquid Extraction, Turbulence Structure.

O. C. SITTON (Ph.D., Missouri-Rolla)—Bioengineering

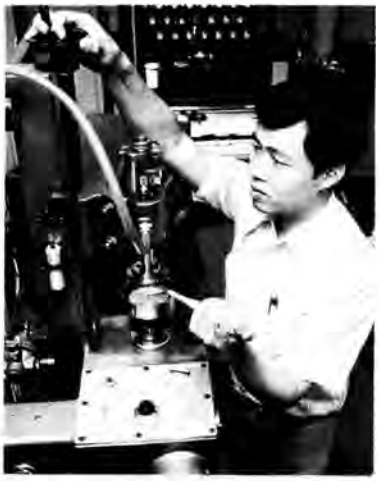
R. C. WAGGONER (Ph.D., Texas A&M)—Multistage Mass Transfer Operations, Distillation, Extraction, Process Control.

H. K. YASUDA (Ph.D., New York-Syracuse)—Polymer Membrane Technology, Thin-Film Technology, Plasma Polymerization, Biomedical Materials.

R. M. YBARRA (Ph.D., Purdue)—Rheology of Polymer Solutions, Chemical Reaction Kinetics.

Financial aid is obtainable in the form of Graduate and Research Assistantships, and Industrial Fellowships. Aid is also obtainable through the Materials Research Center.

Advanced Studies in Chemical Engineering at NJIT



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Faculty: Chemistry Division

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CURRENT RESEARCH AREAS

ENVIRONMENTAL ENGINEERING

Air pollutant analysis and transport of organic compounds ☐ Biological and chemical detoxification ☐ Design of air pollution control equipment ☐ Toxicology

REACTION KINETICS AND REACTOR DESIGN

Fixed and fluidized bed reactors ☐ Free radical and global reaction kinetics ☐ Biochemical reactors ☐ Reactor modeling and transport mechanisms

THERMODYNAMICS

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POLYMER SCIENCE AND ENGINEERING

Rheology of polymer melts ☐ Synthesis of dental adhesive ☐ Photo initiated polymerization ☐ Size distribution of emulsion polymerization ☐ Fire resistance fibers

BIOMEDICAL ENGINEERING

Thixotropic property of human blood ☐ Modified glucose tolerance test ☐ Mathematical modeling of metabolic processes

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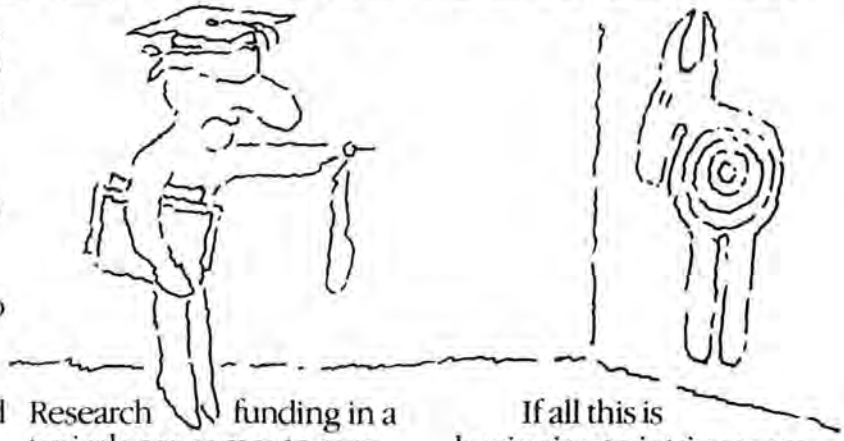

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Department of Chemical Engineering, Box 7905, North Carolina State University, Raleigh, North Carolina 27695-7905.

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Northwestern University

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John B. Butt
Chemical reaction engineering
Stephen H. Carr
Solid state properties of polymers
William C. Cohen
Control and measurement of distributed parameter systems
Buckley Crist Jr.
Polymer science
Joshua S. Dranoff
Chemical reaction engineering, chromatographic separations
Thomas K. Goldstick
Biomedical engineering, oxygen transport in the human body
Hugh M. Hulburt
Chemical and physical process fundamentals
Iftekhar Karimi
Computer-aided design, scheduling of noncontinuous processes
Harold H. Kung
Kinetics, heterogeneous catalysis
Richard S.H. Mah
Computer-aided process planning, design and analysis, distillation systems
Gregory Ryskin
Fluid mechanics, computational methods, polymeric liquids
Wolfgang M.H. Sachtler
Heterogeneous catalysis
John C. Slattery
Interfacial transport phenomena, multiphase flows
William F. Stevens
Process control and optimization, computer applications
John M. Torkelson
Polymer science

For information and application to the graduate program, write

Harold H. Kung
Chairperson of Graduate Program
Department of Chemical Engineering
Northwestern University
Evanston, Illinois 60201

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Coulmbus, Ohio 43210
(614) 422-6986

Robert S. Brodkey
Wisconsin 1952
Turbulence, Mixing, Image Analysis Reactor Design, Rheology

James F. Davis
Northwestern 1982
Artificial Intelligence, Computer Aided Design, Mass Transfer, and Heat Transfer

L. S. Fan
West Virginia 1975
Fluidization, Chemical & Biochemical Reaction Engineering, and Mathematical Modeling

Edwin R. Haering
Ohio State 1966
Reaction Engineering, Catalysis, and Adsorption

Harry C. Hershey
Missouri-Rolla 1965
Thermodynamics, and Drag Reduction

Kent S. Knaebel
Delaware 1980
Mass Transfer, Separations, Computer-Aided Design, and Power Conversion Cycles

L. James Lee
Minnesota 1979
Polymer Processing, Heat Transfer, and Rheology

Won-Kyoo Lee
Missouri-Columbia 1972
Process Control, Computer Control, and Computer-Aided Design

Umit Ozkan
Iowa State 1984
Heterogeneous Catalysis, and Reaction Kinetics

Duane R. Skidmore
Fordham 1960
Coal Processing, and Biochemical Engineering

Edwin E. Smith
Ohio State 1949
Combustion, and Environmental Engineering

Thomas L. Sweeney
Case 1962
Air Pollution Control, Heat Transfer, and Legal Aspects of Engineering

Shang-Tian Yang
Purdue 1984
Biochemical Engineering and Biotechnology, Fermentation Process and Kinetics

Jacques L. Zakin
New York 1959
Drag Reduction, Rheology, and Emulsions

UNIVERSITY OF OKLAHOMA

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Areas Of Research Interest:

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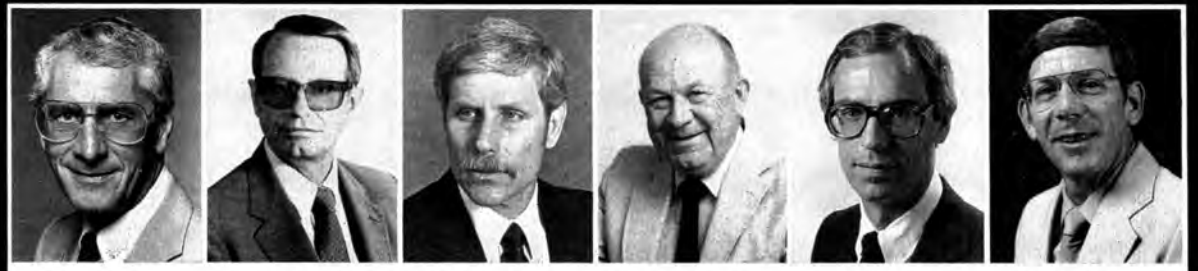

Dr. B. L. Crynes | Dr. Kenneth J. Bell | Dr. Anthony L. Hines | Dr. Robert Maddox | Dr. R. Robinson, Jr. | Dr. Jan Wagner

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Dr. G. L. Foutch | Dr. A. H. Johannes | Dr. M. Seapan | Mr. William E. Payne | Dr. Ruth C. Erbar | Dr. R. A. Wills

Address inquiries to:

Billy L. Crynes
School of Chemical Engineering
Oklahoma State University
Stillwater, OK 74078

university of

pennsylvania chemical engineering

RESEARCH AREAS

Applied Mathematics
Biochemical Engineering
Biomedical Engineering
Chemical Reactor Engineering
Combustion
Computer-Aided Design
Crystal Growth
Electrochemistry
Fluid Mechanics
Heterogeneous Catalysis
Interfacial Phenomena
Membrane Transport
Numerical Analysis
Polymer Science
Reaction Kinetics
Separation Techniques
Solar Energy
Surface Phenomena
Thermodynamics
Transport Phenomena

Pennsylvania's chemical engineering program is designed to be flexible while emphasizing the fundamental nature of chemical and physical processes. Students may focus their studies in any of the research areas of the department. The full resources of this Ivy League university, including the Wharton School of Business and one of this country's foremost medical centers, are available to students in the program.

FACULTY

Stuart W. Churchill, PhD, Michigan (1952)
Gregory C. Farrington, PhD, Harvard (1972)
William C. Forsman, PhD, Pennsylvania (1961)
Eduardo D. Glandt, PhD, Pennsylvania (1977)
Raymond J. Gorte, PhD, Minnesota (1981)
David J. Graves, ScD, MIT (1967)
Douglas A. Lauffenburger, Ph.D., Minnesota (1979)
Mitchell Litt, D. Eng Sci., Columbia (1961)
Alan L. Myers, PhD, California (1964)
Daniel D. Perlmutter, PhD, Yale (1956)
John A. Quinn, Ph.D. Princeton (1959)
Warren D. Seider, PhD, Michigan (1966)
Lyle H. Ungar, PhD, MIT (1984)
Paul B. Weisz, ScD, Zurich (1965)

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For additional information, write:

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Department of Chemical Engineering
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Philadelphia, Pennsylvania 19104-6393

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Transport Phenomena on Arterial Wall

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Propagation Phenomena in Multicomponent Systems
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Catalysis, Kinetics and Reactors
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Systems Engineering and Computer Aided Design
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Graduate Information
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W. N. Delgass
R. E. Eckert
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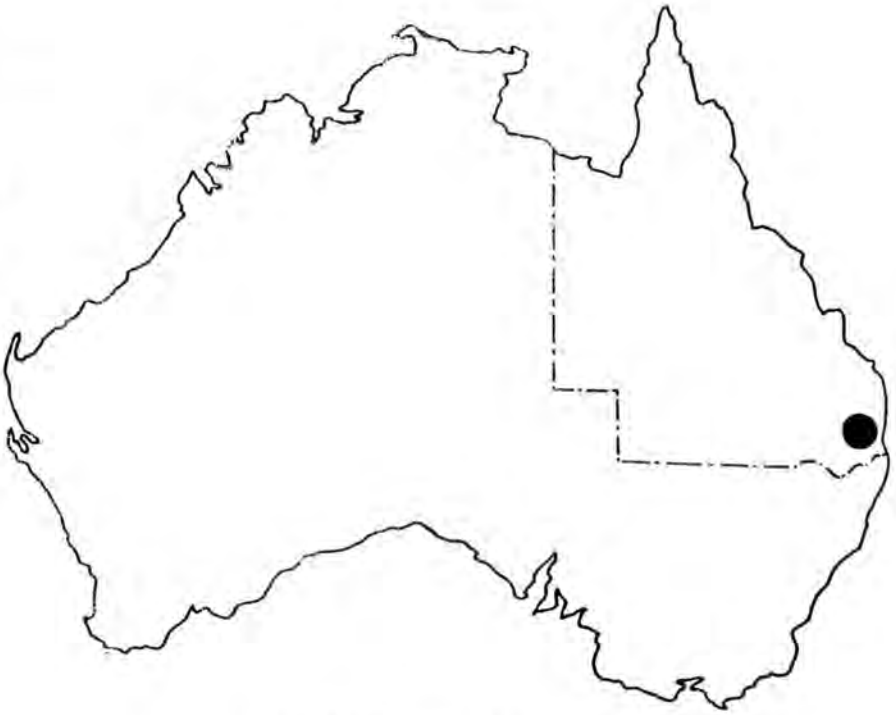

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I. T. CAMERON (Imperial College)
D. D. DO (Queensland)
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THE DEPARTMENT

The Department occupies its own building, is well supported by research grants, and maintains an extensive range of research equipment. It has an active postgraduate programme, which involves course work and research work leading to M.Eng. Studies, M.Eng.Science and Ph.D.degrees.

THE UNIVERSITY AND THE CITY

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For further information write to: Co-ordinator of Graduate Studies, Department of Chemical Engineering, University of Queensland, Brisbane, Qld. 4067 AUSTRALIA.

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- ☐ Simultaneous diffusion and chemical reaction
- ☐ Thermodynamics
- ☐ Water resources

The Faculty

Michael M. Abbott *Ph.D., Rensselaer*
Elmar R. Altwicker *Ph.D., Ohio State*
Donald B. Aulenbach *Ph.D., Rutgers*
Georges Belfort *Ph.D., California–Irvine*
Henry R. Bungay III *Ph.D., Syracuse*
Chan I. Chung *Ph.D., Rutgers*
Nicholas L. Clesceri *Ph.D., Wisconsin*
Steven M. Cramer *Ph.D., Yale*
Arthur Fontijn *D.Sc., Amsterdam*
Richard T. Lahey, Jr. *Ph.D., Stanford*
Peter K. Lashmet *Ph.D., Delaware*
Howard Littman *Ph.D., Yale*
Morris H. Morgan III *Ph.D., Rensselaer*
Charles Muckenfuss *Ph.D., Wisconsin*
E. Bruce Nauman *Ph.D., Leeds*
Michael H. Peters *Ph.D., Ohio State*
Sanford S. Sternstein *Ph.D., Rensselaer*
Hendrick C. Van Ness *D.Eng., Yale*
Peter C. Wayner, Jr. *Ph.D., Northwestern*

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Dr. P.K. Lashmet, Executive Officer
Department of Chemical Engineering and Environmental Engineering
Rensselaer Polytechnic Institute, Troy, New York 12180-3590

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- CONSTANTINE D. ARMENIADES (Case Western Reserve, 1969) Polymers and composites, biomaterials.
- SAM H. DAVIS, JR. (MIT, 1957) Dynamics of chemical systems, optimization, and process control.
- DEREK C. DYSON (London, 1966) Interfacial phenomena, hydrodynamic stability, and enhanced oil recovery.
- J. DAVID HELLUMS (Michigan, 1961) Fluid mechanics and biomedical engineering
- JOE W. HIGHTOWER (Johns Hopkins, 1963) Kinetics and heterogeneous catalysis.
- RIKI KOBAYASHI (Michigan, 1951) Thermodynamics and transport properties, chromatography, coal liquefaction, and high-pressure properties.
- THOMAS W. LELAND, JR. (Texas, 1954) Thermodynamic properties.
- LARRY V. McINTIRE (Princeton, 1970) Rheology, fluid mechanics, and biomedical engineering.
- CLARENCE A. MILLER (Minnesota, 1969) Interfacial phenomena, enhanced oil recovery, detergency
- E. TERRY PAPOUTSAKIS (Purdue, 1979) Biochemical engineering and applied mathematics.
- MARK A. ROBERT (Swiss Fed. Institute of Technology, 1980) Thermodynamics, statistical mechanics.
- KA-YIU SAN (CalTech, 1983) Biochemical engineering, and process control
- KYRIACOS ZYGOURAKIS (Minnesota, 1981) Chemical reaction engineering, computer applications for control and data acquisition.

APPLICATIONS

Chairman, Graduate Committee
Department of Chemical Engineering
P.O. Box 1892
Rice University
Houston, TX 77251

Chemical Engineering at the
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For further information and applications, contact:

Professor John C. Friedly, Chairman
Department of Chemical Engineering
University of Rochester
Rochester, New York 14627
Phone: (716) 275-4042

Faculty and Research Areas

S. H. CHEN, Ph.D. 1981, Minnesota
Polymer Science and Engineering, Transport Phenomena, Solution Thermodynamics

E. H. CHIMOWITZ, Ph.D. 1982, Connecticut
Computer-Aided Design, Super-Critical Extraction, Control

G. R. COKELET, Sc.D. 1963, M.I.T.
Microcirculatory Transport Processes, Biomedical Engineering

M. R. FEINBERG, Ph.D. 1968, Princeton
Complex Reaction Systems, Applied Mathematics

J. R. FERRON, Ph.D. 1958, Wisconsin
Molecular Transport Processes, Applied Mathematics

J. C. FRIEDLY, Ph.D. 1965, California (Berkeley)
Process Dynamics, Control, Heat Transfer

R. H. HEIST, Ph.D. 1972, Purdue
Nucleation, Aerosols, Atmospheric Chemistry

J. JORNE, Ph.D. 1972, California (Berkeley)
Electrochemical Engineeriing, Microelectronic Processing, Theoretical Biology

R. H. NOTTER, M.D., Ph.D. 1969, Washington (Seattle)
Biomedical Engineering, Lung Surfactants and Lung Disease, Aerosols

H. J. PALMER, Ph.D. 1971, Washington (Seattle)
Interfacial Phenomena, Mass Transfer

H. SALTSBURG, Ph.D. 1955, Boston
Surface Phenomena, Catalysis, Molecular Scattering

S. V. SOTIRCHOS, Ph.D. 1982, Houston
Reaction Engineering, Combustion and Gasification of Coal, Gas-Solid Reactions

UNIVERSITY OF SOUTH CAROLINA

The Chemical Engineering Department offers M.S., M.E., and Ph.D. degrees. Graduate students have the opportunity to work closely with the faculty on research projects. Research and teaching stipends are available.

The University of South Carolina, with an enrollment of 23,800 on the Columbia campus, offers a variety of cultural and recreational activities. Columbia is part of one of the fastest growing areas in the country.

The Chemical Engineering Faculty

B.L. Baker, Distinguished Professor Emeritus, Ph.D., North Carolina State University, 1955 (*Process design, environment problems, ion transport*).

M.W. Davis, Jr., Weisiger Chair Professor, Ph.D., University of California (Berkeley), 1951 (*Kinetics and catalysis, chemical process analysis, solvent extraction, waste treatment*).

F.A. Gadala-Maria, Assistant Professor, Ph.D., Stanford University, 1979 (*Fluid mechanics, rheology*).

J.H. Gibbons, Professor, Ph.D., University of Pittsburgh, 1961 (*Heat transfer, fluid mechanics*).

E.L. Hanzevack, Jr., Associate Professor, Ph.D., Northwestern University, 1974 (*Two-phase flow, turbulence*).

F.P. Pike, Professor Emeritus, Ph.D., University of Minnesota, 1949 (*Mass transfer in liquid-liquid systems, vapor-liquid equilibria*).

T.G. Stanford, Assistant Professor, Ph.D., The University of Michigan, 1977 (*Chemical reactor engineering, mathematical modeling of chemical systems, process design, thermodynamics*).

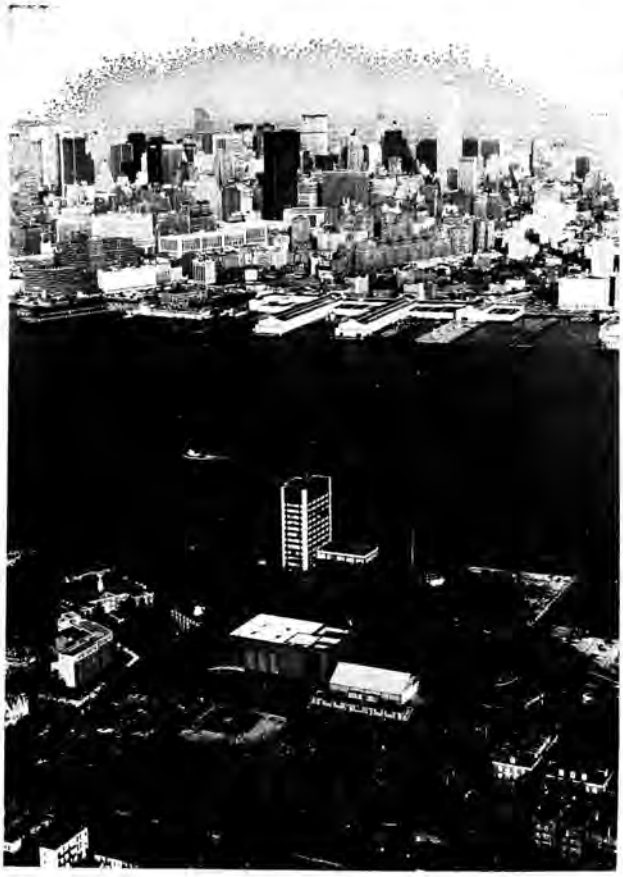
V. Van Brunt, Associate Professor, Ph.D., University of Tennessee, 1974 (*Mass transfer, computer modeling, liquid extraction*).

J.W. Van Zee, Assistant Professor, Ph.D., Texas A & M University, 1984 (*Electrochemical systems, mathematical modeling, statistical applications*).

R.W. Wenig, Assistant Professor, Ph.D., Iowa State University, 1986 (*Catalysis, reaction kinetics, surface science*).

FOR FURTHER INFORMATION CONTACT

Prof. J.H. Gibbons
Chairman, Chemical Engineering
College of Engineering
University of South Carolina
Columbia, SC 29208



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H. Assadipour (PhD, Michigan Tech. U.)
J.A. Biesenberger (PhD, Princeton U.)
G.B. Delancey (PhD, Pittsburgh U.)
C.G. Gogos (PhD, Princeton U.)
D.M. Kalyon (PhD, McGill U.)
S. Kovenklioglu (PhD, Stevens)
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Hoboken, NJ 07030
201-420-5234

For additional information, contact:
Department of Chemistry and Chemical Engineering
Stevens Institute of Technology
Hoboken, NJ 07030
201-420-5546

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For Information write:

Philip A. Rice, Chairman
Department of Chemical Engineering and Materials Science
Syracuse University
320 Hinds Hall
Syracuse, New York, 13244

THE FACULTY

Allen J. Barduhn	Desalination
John C. Heydweiller	Computational Methods, Simulation
Cynthia S. Hirtzel	Colloidal Science and Environmental Modelling
George C. Martin	Polymer Properties and Applications
Philip A. Rice	Biotransport Phenomena
Ashok Sangani	Theoretical Fluid Mechanics
Klaus Schroder	Electrical and Magnetic Properties of Materials
James A. Schwarz	Catalysis, Surface Phenomena
S. Alexander Stern	Membrane Processes
Lawrence L. Tavlarides	Multiphase Reaction Systems
Chi Tien	Adsorption and Fluid Particle Separation

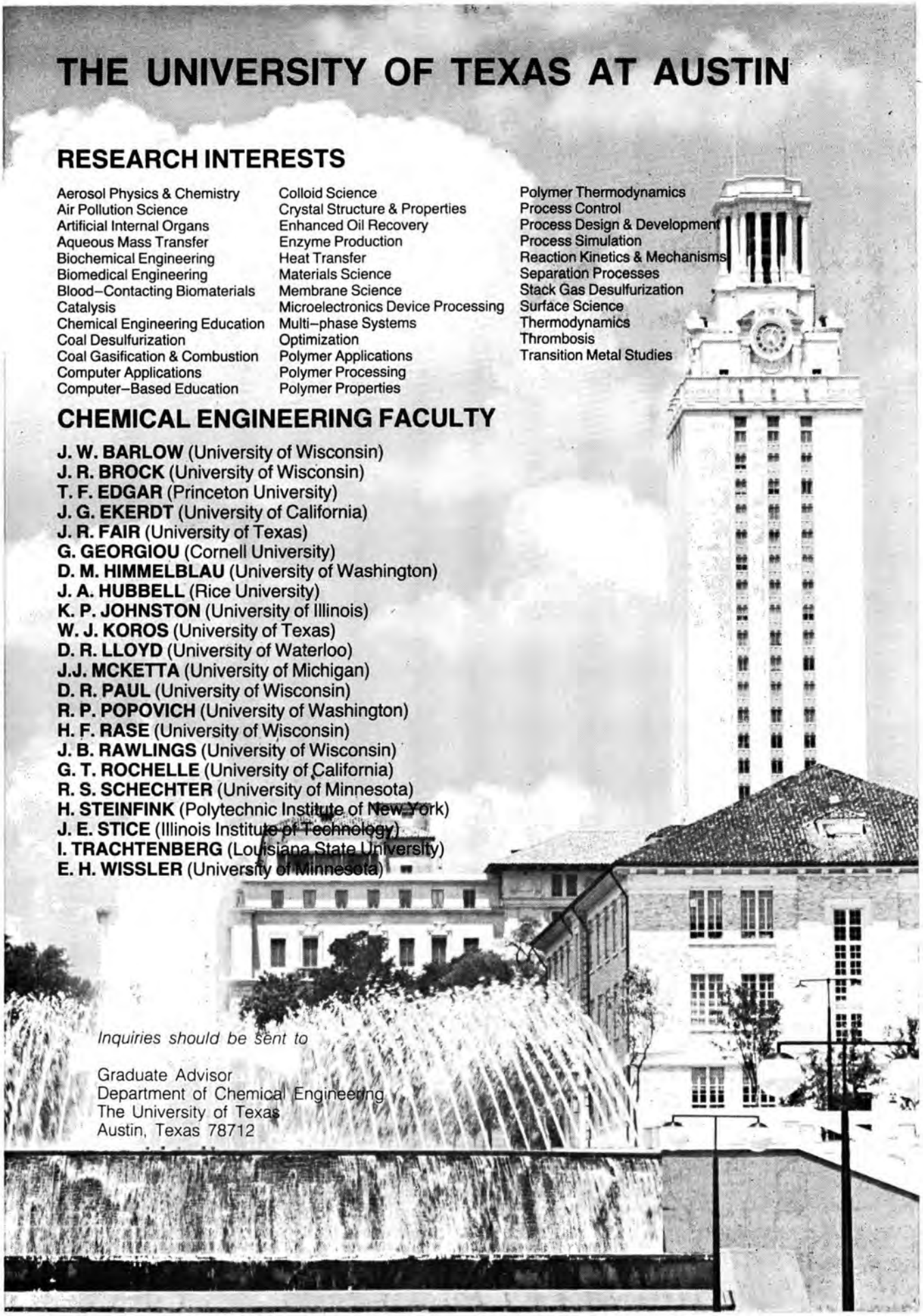
THE UNIVERSITY OF TEXAS AT AUSTIN

RESEARCH INTERESTS

Aerosol Physics & Chemistry
Air Pollution Science
Artificial Internal Organs
Aqueous Mass Transfer
Biochemical Engineering
Biomedical Engineering
Blood–Contacting Biomaterials
Catalysis
Chemical Engineering Education
Coal Desulfurization
Coal Gasification & Combustion
Computer Applications
Computer–Based Education
Colloid Science
Crystal Structure & Properties
Enhanced Oil Recovery
Enzyme Production
Heat Transfer
Materials Science
Membrane Science
Microelectronics Device Processing
Multi–phase Systems
Optimization
Polymer Applications
Polymer Processing
Polymer Properties
Polymer Thermodynamics
Process Control
Process Design & Development
Process Simulation
Reaction Kinetics & Mechanisms
Separation Processes
Stack Gas Desulfurization
Surface Science
Thermodynamics
Thrombosis
Transition Metal Studies

CHEMICAL ENGINEERING FACULTY

J. W. BARLOW (University of Wisconsin)
J. R. BROCK (University of Wisconsin)
T. F. EDGAR (Princeton University)
J. G. EKERDT (University of California)
J. R. FAIR (University of Texas)
G. GEORGIOU (Cornell University)
D. M. HIMMELBLAU (University of Washington)
J. A. HUBBELL (Rice University)
K. P. JOHNSTON (University of Illinois)
W. J. KOROS (University of Texas)
D. R. LLOYD (University of Waterloo)
J.J. MCKETTA (University of Michigan)
D. R. PAUL (University of Wisconsin)
R. P. POPOVICH (University of Washington)
H. F. RASE (University of Wisconsin)
J. B. RAWLINGS (University of Wisconsin)
G. T. ROCHELLE (University of California)
R. S. SCHECHTER (University of Minnesota)
H. STEINFINK (Polytechnic Institute of New York)
J. E. STICE (Illinois Institute of Technology)
I. TRACHTENBERG (Louisiana State University)
E. H. WISSLER (University of Minnesota)



Inquiries should be sent to

Graduate Advisor
Department of Chemical Engineering
The University of Texas
Austin, Texas 78712

Texas A&M University

• THE UNIVERSITY •

Texas A&M is a land-grant and sea-grant university, and the oldest public institution of higher learning in Texas. The current enrollment is about 36,000. The university location is Bryan/College Station, Texas—twin cities with a combined population of 122,000 (including students). The surrounding country is deciduous forest—Houston is 95 miles Southeast and Dallas is 180 miles North.

• THE DEPARTMENT •

The ChE department has an enrollment of about 500 undergraduates and 100 graduates. ChE has excellent facilities in the Zachry Engineering Center. All graduate students have desk space. Graduate stipends are currently up to $1050/month for teaching assistantships and fellowships. Research assistantships are $824/month for M.Sc. students and $989/month for Ph.D. students.

FACULTY AND RESEARCH INTERESTS

C. D. Holland (department head)—distillation
A. Akgerman—kinetics, reaction engineering
R. G. Anthony—catalysis, reaction engineering
D. B. Bukur—reaction engineering
J. A. Bullin—gas sweetening, air pollution
R. Darby—rheology, polymers
R. R. Davison—methanol fuel
L. D. Durbin—process control
P. T. Eubank—thermodynamics
A. M. Gadalla—materials, catalysis
C. J. Glover—polymer solutions
K. R. Hall—thermodynamics
D. T. S. Hanson—biochemical
J. C. Holste—thermodynamics
M. T. Holtzapple—biochemical engineering
H. A. Preisig—process control
A. T. Watson—porous media
R. E. White—electrochemical applications

FOR INFORMATION CONTACT:

Graduate Advisor
Chemical Engineering Dept.
Texas A&M University
College Station, TX 77843
409/845-3361

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MATERIALS AND INTERFACES: Polymers and Fiber Science, Composite Materials, Adhesion at Interfaces, Stability and Rheology of Suspensions, Coal Slurries, VLSI Fabrication

BIOCHEMICAL ENGINEERING: Fermentation Technology, Mammalian Cell Bioreactors, Separation of Biomolecules

KINETICS AND CATALYSIS: Heterogeneous Catalysis, Electrocatalytic Processes

ENVIRONMENTAL ENGINEERING

BIOMEDICAL ENGINEERING

THERMODYNAMICS

OPTIMIZATION

FOR INFORMATION AND APPLICATIONS, WRITE:

PROF. GREGORY D. BOTSARIS, CHAIRMAN
DEPARTMENT OF CHEMICAL ENGINEERING
TUFTS UNIVERSITY
MEDFORD, MA 02155

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chemical and microbiological processing, chemicals from renewable resources

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homogeneous, heterogeneous, spectroscopy, novel immobilizations of homogeneous systems, zeolite synthesis

Coal Science and Process Chemistry
chemistry of prompt intermediates, reaction paths in coal liquefaction, fate of trace elements, fluidized beds

Surface Chemistry
semiconductors, model catalysis, metal oxides, gas sensors, combined high pressure UHV surface analysis

Microcomputers, Digital Electronics, and Control
digital process measurements, microcomputer interfacing, remote data acquisition, digital controls

Polymer Science and Engineering
processing, morphology, synthesis, surface science, biopolymers

Biochemical Engineering
synthetic foods, antibiotics, fermentation process design and instrumentation, environmental engineering

Surface Activity
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Write to: Graduate Committee, Chemical Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061

University of Washington

Department of Chemical Engineering

The University of Washington, on a distractingly beautiful campus, has about 28,000 full-time students. A talented faculty, excellent physical facilities, and well-supported research programs provide a stimulating and supportive research environment. The department has about sixty-five graduate students, of whom typically ten to twelve are foreign students and the remainder are from about thirty universities in over twenty states. All full-time graduate students are supported, and there is a fine esprit de corps among the graduate students and faculty. Seattle is a beautiful city with outstanding cultural activities and unparalleled outdoor activities throughout the year.

We welcome your inquiry. For further information please write:

Chairman
Department of Chemical Engineering, BF–10
University of Washington
Seattle, WA 98195

Regular Faculty

John C. Berg, Ph.D., California (Berkeley)
J. Ray Bowen, Ph.D., Stanford
(Dean, College of Engineering)
E. James Davis, Ph.D., Washington
Bruce A. Finlayson, Ph.D., Minnesota
Rod R. Fisher, Ph.D., Iowa State
William J. Heideger, Ph.D., Princeton
Bradley R. Holt, Ph.D., Wisconsin
Eric W. Kaler, Ph.D., Minnesota
Barbara B. Krieger, Ph.D., Wayne State
N. Lawrence Ricker, Ph.D., California
(Berkeley)
James C. Seferis, Ph.D., Delaware
Charles A. Sleicher, Ph.D., Michigan
Eric M. Stuve, Ph.D., Stanford

Research Faculty

Thomas A. Horbett, Ph.D., Washington

Adjunct and Joint Faculty Active in Department Research

G. Graham Allan, Ph.D., Glasgow
Allan S. Hoffman, Sc.D., M.I.T.
William T. McKean, Ph.D., Washington
Michael J. Pilat, Ph.D., Washington
Buddy D. Ratner, Ph.D., Brooklyn Polytechnic
Kyosti V. Sarkanen, Ph.D., State University of New York

Research Areas

Aerosols
Applied Mathematics
Biochemical Separations
Biomaterials
Biomedical Engineering
Catalytic and Electrochemical Surface Science
Colloids and Microemulsions
Electrochemical Engineering
Heat Transfer
Interfacial Phenomena
Mathematical Modeling
Microparticle Chemical Physics
Polymer Science
Polymeric Composites
Process Design, Control, and Optimization
Reaction Engineering
Surface and Colloid Science

WASHINGTON STATE UNIVERSITY

Chemical Engineering Department

Here at Washington State University, we are proud of our graduate program, and of our students. The program has been growing quickly in size and quality, but is still small and informal.

For a department of this size, the range of faculty research interests is very broad. Students choose research projects of interest to them, then have the opportunity—and the responsibility—to make an individual contribution.

Through a combination of core courses and many electives, students can gain a thorough understanding of the basics of chemical engineering.

FACULTY AND RESEARCH INTERESTS

J. M. Lee (Ph.D., University of Kentucky): plant tissue cultivation, genetic engineering, enzymatic hydrolysis, mixing.

K. C. Liddell (Ph.D., Iowa State University): semiconductor electrochemistry, reactions on fractal surfaces, separations, dynamic X-ray diffraction, radioactive waste management.

R. Mahalingam (Ph.D., University of Newcastle-upon-Tyne): multiphase systems, physical and chemical separations, particulate phoretic phenomena, electronic materials and polymers, synfuels and environment.

R. C. Miller (Ph.D., University of California—Berkeley): chemical/phase equilibria, thermodynamic properties, cryogenics, chemical process engineering.

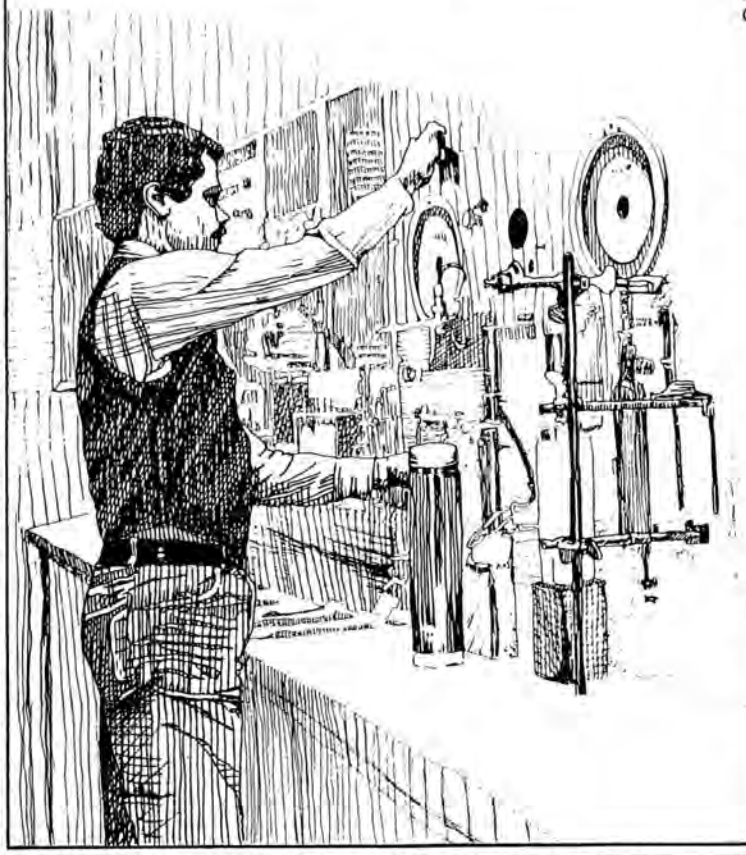
J. N. Petersen (Ph.D., Iowa State University): adaptive on-line optimization of biochemical processes, adaptive control, drying of food products.

J. C. Sheppard (Ph.D., Washington University): radioactive wastes, actinide element chemistry, atmospheric chemistry, radiocarbon dating.

W. J. Thomson (Ph.D., University of Idaho): kinetics of solid state reactions, chemical reaction engineering.

B. J. Van Wie (Ph.D., University of Oklahoma): kinetics of mammalian tissue cultivation, bio-reactor design, centrifugal blood cellular separations, development of biochemical sensors.

R. L. Zollars (Ph.D., University of Colorado): multiphase reactor design, polymer reactor design, colloidal phenomena, in-situ fossil fuel recovery, chemical vapor deposition reactor design.



GRADUATE DEGREE PROGRAMS AT WSU

M.S. in Chemical Engineering
Twelve credits in graduate chemical engineering courses, nine credits in supporting courses, and a thesis are required.

Ph.D. in Chemical Engineering
Eighteen credits in graduate chemical engineering courses, sixteen credits in supporting courses, and a dissertation are required. Upon successful completion of the coursework and the Ph.D. preliminary examination, a student is admitted to candidacy for the degree. The dissertation must represent a significant original contribution to the research literature.

Conversion Program
Students with B.S. degrees in the physical or life sciences may apply for admission to the conversion program. Normally a small number of undergraduate courses must be taken in addition to the regular requirements for the M.S. or Ph.D.

FINANCIAL ASSISTANCE

Research or teaching assistantships, partial tuition waivers, and fellowships are available, and nearly all of our students receive financial assistance. Living costs are quite low.

WANT TO APPLY? Contact: Dr. K.C. Liddell, Graduate Coordinator, Department of Chemical Engineering, Washington State University, Pullman, WA 99164-2710, 509/335-4332 or 509/335-3710.

Washington University

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MASTER'S AND DOCTORAL PROGRAMS

RESEARCH AREAS

Reaction Engineering

Transport Phenomena

Thermodynamics

Process Design And Control

Polymer And Materials Engineering

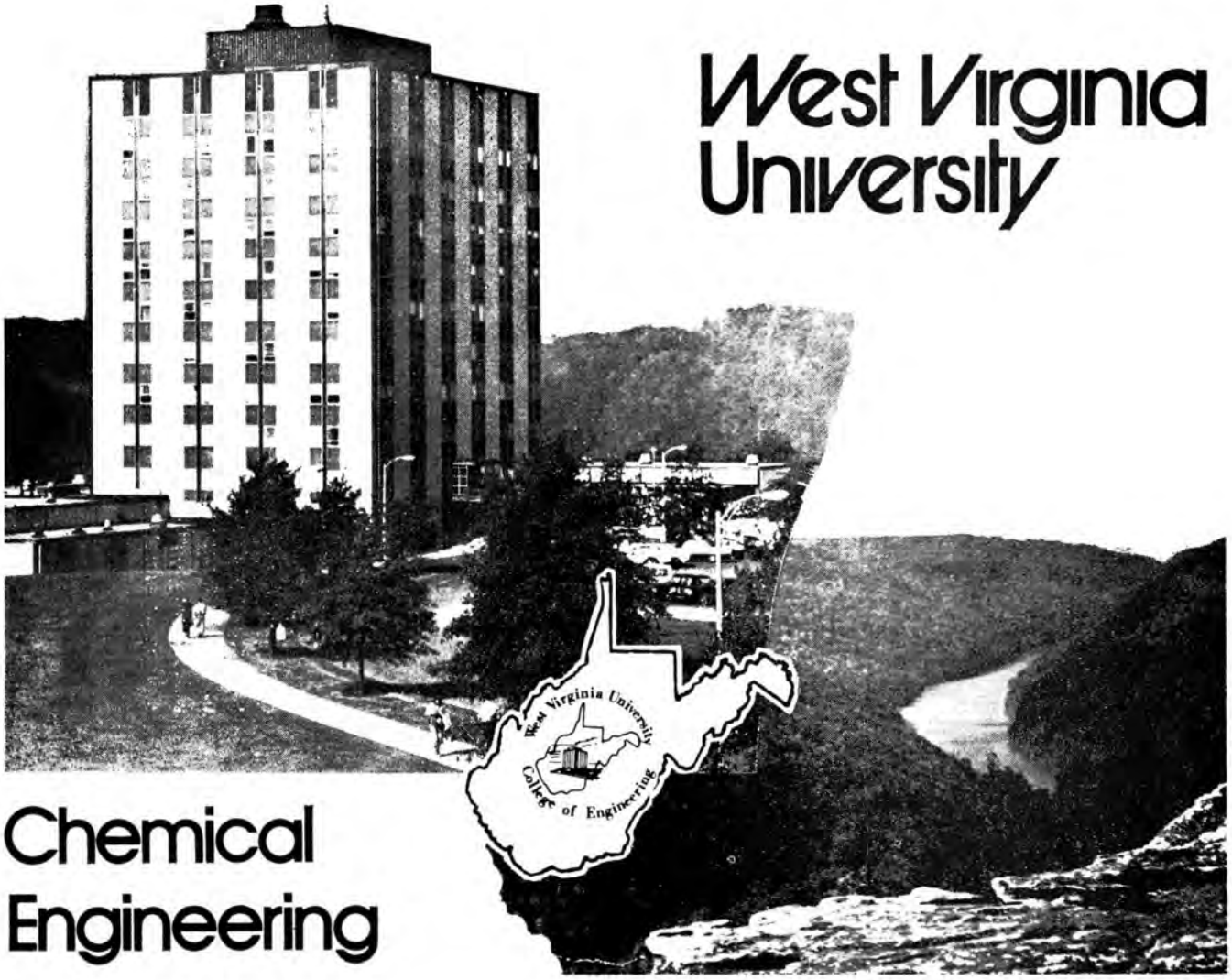
Biomedical Engineering

Biochemical Engineering

FOR INFORMATION CONTACT

Graduate Admissions Committee
Department of
Chemical Engineering
Washington University
St. Louis, Missouri 63130

West Virginia University



Chemical Engineering

Faculty

Richard C. Bailie (Iowa State Univ.)
Eugene V. Cilento (Univ. of Cincinnati)
Dady B. Dadyburjor (Univ. of Delaware)
Joseph D. Henry, Jr., Chair. (Univ. of Michigan)
Hisashi O. Kono (Kyushu Univ.)
Joseph A. Shaeiwitz (Carnegie-Mellon Univ.)
Alfred H. Stiller (Univ. of Cincinnati)
R. Turton (Oregon State)
Wallace B. Whiting (Univ. California, Berkeley)
Ray Y. K. Yang (Princeton Univ.)
John W. Zondlo (Carnegie-Mellon Univ.)

Topics

Catalysis and Reaction Engineering
Separation Processes
Surface and Colloid Phenomena
Phase Equilibria
Fluidization
Biomedical Engineering
Solution Chemistry
Transport Phenomena
Biochemical Engineering
Biological Separations

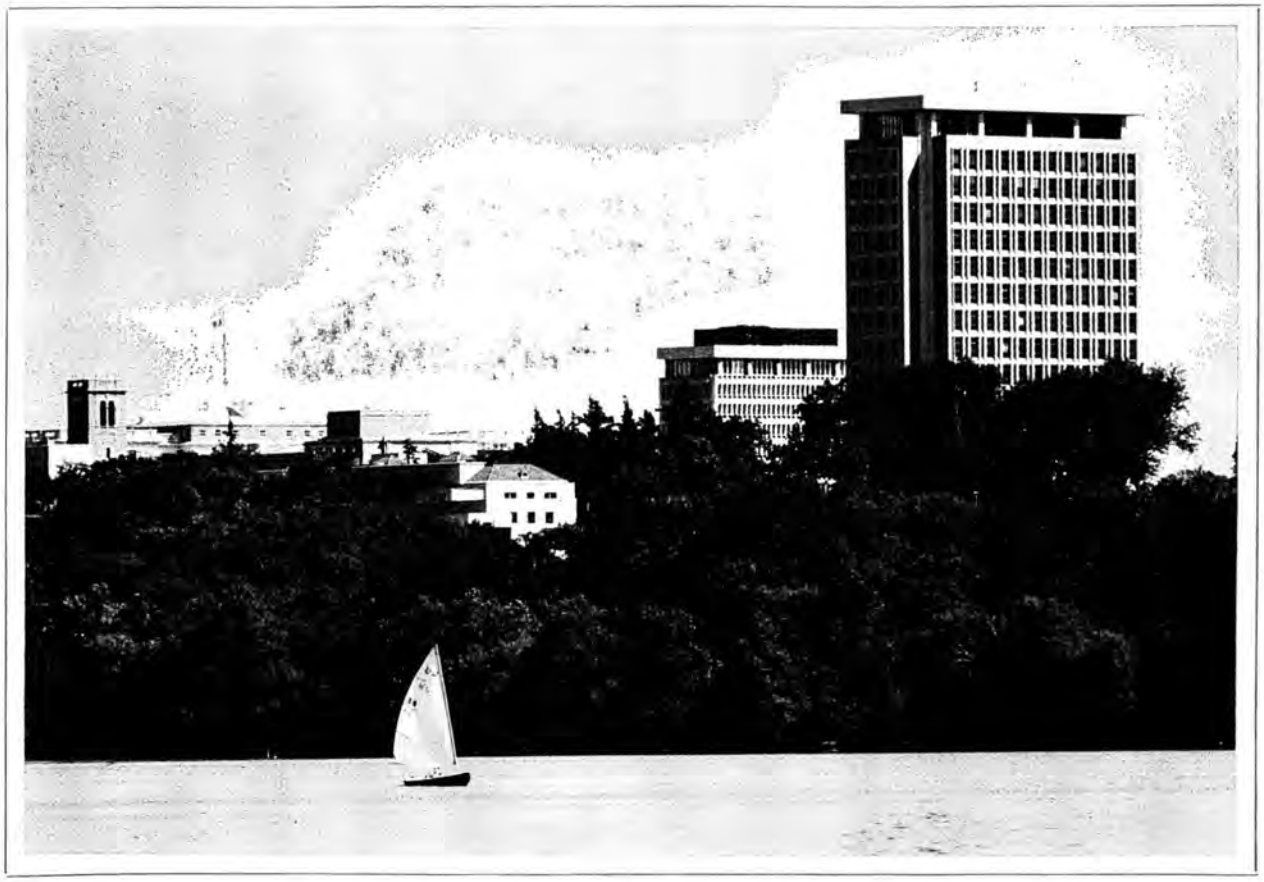
M.S. and Ph.D. Programs

For further information on financial aid write:

Graduate Admission Committee
Department of Chemical Engineering
P.O. Box 6101
West Virginia University
Morgantown, West Virginia 26506-6101

Wisconsin

A tradition of excellence in Chemical Engineering



Faculty Research Interests

R. Byron Bird
Transport phenomena, polymer fluid dynamics, polymer kinetic theory

Thomas W. Chapman
Electrochemistry, mass transfer

Camden A. Coberly
Director, Engineering Experiment Station

Stuart L. Cooper (Chmn.)
Polymer science, biomaterials

E. Johansen Crosby
Spray and suspended particle processing

John A. Duffie
Solar energy

James A. Dumesic
Kinetics and catalysis, surface chemistry

Charles G. Hill, Jr.
Kinetics and catalysis, membrane processes

Sangtae Kim
Fluid mechanics, applied mathematics

James A. Koutsky
Polymer science, adhesives, composites

Stanley H. Langer
Kinetics, catalysis, electrochemistry, chromatography, hydrometallurgy

E. N. Lightfoot, Jr.
Mass transport and separations processes, biochemical engineering

W. Robert Marshall
Director, University-Industry Research Program

Patrick D. McMahon
Statistical thermodynamics, renormalization group theory

W. Harmon Ray
Process dynamics and control, reactor engineering

Thatcher W. Root
Heterogeneous catalysis, surface science

Dale F. Rudd
Process design and industrial development

Glenn A. Sather
Development of instructional program

Warren E. Stewart
Reactor modeling, transport phenomena, applied mathematics

Ross E. Swaney
Design research, computer-aided design

For further information about graduate study in chemical engineering, write:

THE GRADUATE COMMITTEE
Department of Chemical Engineering
University of Wisconsin-Madison
1415 Johnson Drive
Madison, Wisconsin 53706

BUCKNELL

BUCKNELL UNIVERSITY
Department of Chemical Engineering

MS PROGRAM

W. E. KING, Jr., Chairman (Ph.D., University of Pennsylvania). Mathematical modeling of biomedical systems, applied mathematics.

M. E. Hanyak, Jr. (Ph.D., University of Pennsylvania). Computer-aided design and instruction, problem-oriented languages, numerical analysis.

F. W. Koko, Jr. (Ph.D., Lehigh University) Optimization algorithms, fluid mechanics and rheology, direct digital control.

J. M. Pommersheim (Ph.D., University of Pittsburgh). Catalyst deactivation, reaction analysis, methematical modeling, and diffusion with reaction and phase change, cement hydration.

R. E. Slonaker, Jr. (Ph.D., Iowa State). Growth and properties of single crystals, high-temperature calorimetry, vapor-liquid equilibria in ternary systems.

W. J. Snyder (Ph.D., Pennsylvania State University). Catalysis, polymerization, thermal analysis, development of specific ion electrodes, microprocessors, and instrumentation.

Bucknell is a small, private, highly selective university with strong programs in engineering, business and the liberal arts. The College of Engineering is located in the newly renovated Charles A. Dana Engineering Building and operates a state-of-the-art computer-aided engineering and design laboratory equipped with 15 Apollo super microcomputer workstations available to all engineering students. In addition, a DEC VAX 11/780 and PDP 11/44 minicomputers, and a Honeywell DPS 8/C mainframe computer are available. Graduate students have a unique opportunity to work very closely with a faculty research advisor.

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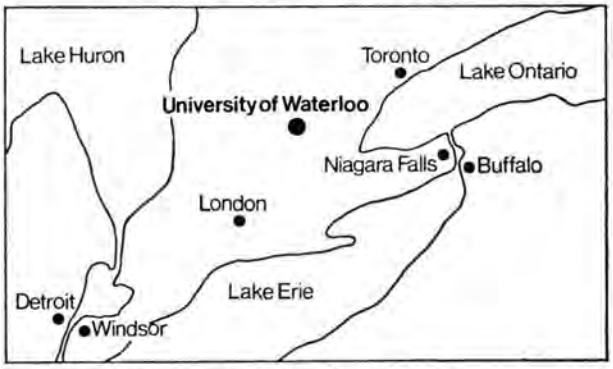
For further information, write or phone:
Dr. William E. King, Jr., Chairman
Department of Chemical Engineering
Bucknell University
Lewisburg, PA 17837
717-524-1114

UNIVERSITY OF WATERLOO



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- ***Chemical Kinetics, Catalysis and Reactor Design**
- ***Environmental and Pollution Control**
- ***Extractive and Process Metallurgy**
- ***Polymer Science and Engineering**
- ***Mathematical Analysis, Statistics and Control**
- ***Transport Phenomena, Multiphase Flow, Petroleum Recovery**
- ***Electrochemical Processes, Solids Handling, Microwave Heating**

Financial Aid: Minimum $13,200 per annum (research option)

Academic Staff: E. Rhodes, Ph.D. (Manchester), Chairman; G. L. Rempel, Ph.D. (UBC), Associate Chairman (Graduate); C. M. Burns, Ph.D. (Polytech. Inst. Brooklyn), Associate Chairman (Undergraduate); L. E. Bodnar, Ph.D. (McMaster); J. J. Byerley, Ph.D. (UBC); K. S. Chang, Ph.D. (Northwestern); I. Chatzis, Ph.D. (Waterloo); P. L. Douglas, Ph.D. (Waterloo); F. A. L. Dullien, Ph.D. (UBC); K. E. Enns, Ph.D. (Toronto); T. Z. Fahidy, Ph.D. (Illinois); G. J. Farquhar, Ph.D. (Wisconsin); J. D. Ford, Ph.D. (Toronto); C. E. Gall, Ph.D. (Minn.); D. A. Holden, Ph.D. (Toronto); R. Y. M. Huang, Ph.D. (Toronto); R. R. Hudgins, Ph.D. (Princeton); R. L. Legge, Ph.D. (Waterloo); I. F. Macdonald, Ph.D. (Wisconsin); M. Moo-Young, Ph.D. (London); G. S. Mueller, Ph.D. (Manchester); K. F. O'Driscoll, Ph.D. (Princeton); D. C.T. Pei, Ph.D. (McGill); A. Penlidis, Ph.D. (McMaster); P. M. Reilly, Ph.D. (London); C. W. Robinson, Ph.D. (Berkeley); A. Rudin, Ph.D. (Northwestern); J. M. Scharer, Ph.D. (Pennsylvania); D. S. Scott, Ph.D. (Illinois); P. L. Silveston, Dr. Ing. (Munich); D. R. Spink, Ph.D. (Iowa State); G. R. Sullivan, Ph.D. (Imperial College); J. R. Wynnyckyj, Ph.D. (Toronto).

To apply, contact:
The Associate Chairman (Graduate Studies)
Department of Chemical Engineering
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1

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DEPARTMENT OF CHEMICAL ENGINEERING

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EDGAR C. CLAUSEN ● Conversion of Biomass into Chemicals and Energy, Biochemical Engineering

JAMES R. COUPER ● Process Design and Economics, Polymers

R. BRUCE ELDRIDGE ● Separation Processes, Biological Separations

JAMES L. GADDY ● Biochemical Engineering, Process Optimization

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CHARLES SPRINGER ● Mass Transfer, Diffusional Processes

THOMAS O. SPICER ● Computer Simulation, Dense Gas Dispersion

CHARLES M. THATCHER ● Mathematical Modeling, Computer Simulation

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For Further Details Contact:

Dr. James L. Gaddy, Professor and Head
Department of Chemical Engineering
227 Engineering Building, University of Arkansas
Fayetteville, AR 72701

Brown University

Graduate Study in Chemical Engineering

Faculty

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Bruce Caswell, Ph.D. (Stanford)
Joseph H. Clarke, Ph.D. (Polytechnic Institute of New York)
Richard A. Dobbins, Ph.D. (Princeton)
Sture K.F. Karlsson, Ph.D. (Johns Hopkins)
Joseph D. Kestin, D.Sc. (University of London)
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Merwin Sibulkin, A.E. (California Institute of Technology)
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A program of graduate study in Chemical Engineering leads toward the M.Sc. or Ph.D. Degree. Teaching and Research Assistantships as well as Industrial and University Fellowships are available.

For further information write:
Professor J. Calo, *Coordinator*
Chemical Engineering Program
Division of Engineering
Brown University
Providence, Rhode Island 02912

LEHIGH UNIVERSITY

Department of Chemical Engineering
Whitaker Laboratory, Bldg. 5
Bethlehem, Pa. 18015

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Catalysis & Reaction Engineering
Thermodynamic Property Research
Energy Conversion Technology
Applied Heat & Mass Transfer
Multiphase Processing

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M.Eng. Program in Design
M.S. and Ph.D. in Polymer Science & Engineering

FINANCIAL AID

Of course.

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For information, write

Dr. Houston K. Huckabay
Professor and Head
Department of Chemical Engineering
Louisiana Tech University
Ruston, Louisiana 71272
(318) 257-2483

The Department of Chemical Engineering at Louisiana Tech University offers a well-balanced graduate program for either the Master's or Doctor of Engineering degree. Twenty-three full-time students (eleven doctoral candidates) and seventeen part-time students are pursuing research in Artificial Intelligence and Adaptive Control, Biotechnology of Natural Polymers, Chemical Hazard and Fire Safety, Energy Use Models, Lignite Utilization, Nuclear Energy, Ozonation, Process Simulation, and Two-Phase Heat Transfer with major concentration in Energy, Environment, and Control Studies.

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Brace H. Boyden, Arkansas
Joseph B. Fernandes, UDCT, Bombay
Houston K. Huckabay, LSU
David H. Knoebel, Oklahoma State
Norman F. Marsolan, LSU
Ronald H. Thompson, Arkansas

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Department of Chemistry and Chemical Engineering

PROGRAM OF STUDY: The department offers a broad range of traditional and interdisciplinary programs leading to the M.S. and Ph.D. degrees. Program areas include the traditional areas of chemistry and chemical engineering wiith particular emphasis in polymer and composite materials; process design, control, and improvement; free radical chemistry; bioorganic chemistry; and surface Raman spectroscopy.

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For more information write:

Graduate Studies Chairman
Department of Chemistry and Chemical Engineering
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Houghton, Michigan 49931

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Studies Leading to M.S. and Ph D. Degrees

Research Areas

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Biomedical Engineering
Catalysis
Energy Sources and Systems
Environmental Control Engineering
Heat and Mass Transport Influence by Fields
Newtonian and Non-Newtonian Fluid Mechanics
Process Control and Modelling of Processes
Single-Cell Protein Research
Themodynamics and Transport Properties of Gases and Liquids
Transport in Biological Systems

WRITE: Dr. Marc de Chazal, Chairman, Deptartment of Chemical Engineering, 1030 Engineering Bldg. University of Missouri, Columbia, MO 65211

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- Thermodynamics and Phase Equilibria

For Application and Information:
Chairman of Chemical Engineering
236 Avery Hall, University of Nebraska
Lincoln, Nebraska 68588-0126

THE UNIVERSITY OF NEW MEXICO

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H. ANDERSON: microelectronics process technology; discharge plasma science; laser/plasma interactions; transport modeling.

C.Y. CHENG: desalination; eutectic freezing; superpurification.

A.K. DATYE: heterogeneous catalysis, electron microscopy of VLSI devices; materials characterization.

D. KAUFFMAN: design; environmental; safety analysis

R.W. MEAD: process analysis; hydrometallurgy; fossil energy.

H.E. NUTTALL: fossil energy research; radio-colloid transport; process control; geo-process modeling.

D.M. SMITH: characterization of powders/porous media; transport phenomena in porous media.

E.S. WILKINS: renewable energy sources; biomedical instrumentation.

F.L.WILLIAMS: catalysis; shock enhanced reactivity of solids and vacuum technology.

For further information, write:

Dr. Douglas Smith, Graduate Advisor
Department of Chemical & Nuclear Engineering
University of New Mexico
Albuquerque, New Mexico 87131
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WRITE TO
Director of Graduate Studies
Chemical Engineering
Princeton University
Princeton, New Jersey 08544

Queens University
Kingston, Ontario, Canada

Graduate Studies in Chemical Engineering

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  - catalytic oxidation
  - gas adsorption in catalysis
  - Ziegler-Natta polymerization
  - reaction network analysis
- Physical Processing
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  - dryforming technology
  - drying of cereal grains
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  - extractive fermentation
  - fermentation using genetically engineered organisms
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  - catalytic cracking
  - Fischer-Tropsch synthesis
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Write:

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Queen's University
Kingston, Ontario, Canada K7L 3N6

Graduate Studies

DEPARTMENT OF CHEMICAL ENGINEERING

University of Saskatchewan

DEPARTMENT OF
CHEMICAL ENGINEERING

FACULTY AND RESEARCH INTEREST

N. N. Bakhshi	Fischer-Tropsch synthesis, Reaction Engineering
W. J. DeCoursey	Absorption with chemical reaction, Mass transfer
M. N. Esmail	Fluid mechanics, Applied Mathematics
G. Hill	Petroleum Recovery, Numerical Modelling
D. Macdonald	Biochemical Engineering
D.-Y. Peng	Thermodynamics of Hydrocarbons and Petroleum
S. Rohani	Mixing with fast chemical reactions, Mathematical Modelling
J. Postlethwaite	Corrosion Engineering
C. A. Shook	Transport Phenomena, Slurry Pipelines

For Information, Write

M. N. Esmail, Head
Department of Chemical Engineering
University of Sasketchewan
Saskatoon, Saskatchewan, Canada S7N 0W0

UNIVERSITY OF SOUTH FLORIDA
TAMPA, FLORIDA 33620

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For further information contact:
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Chemical Engineering
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Tampa, Florida 33620
(813) 974-2581

Faculty

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Research Areas

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Computer Aided Process Design
Crystallization from Solution
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Electrolytic Solutions
Food Science and Engineering
Irreversible Thermodynamics
Mass Transfer with Chemical Reaction
Membrane Transport Properties
Polymer Reaction Engineering
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Fournier, Ronald L., Ph.D., The University of Toledo. Assistant Professor; Transport Phenomena, Thermodynamics, Mathematical Modelling and Combustion.

Jones, Millard L., Jr., Ph.D., University of Michigan. Professor; Process Dynamics and Control, Mathematical Modelling and Heat Transfer.

Lacksonen, James W., Ph.D., Ohio State University. Associate Professor; Chemical Reaction Kinetics and Reactor Design.

Lahti, Leslie E., Dean of Engineering, Ph.D., Carnegie-Mellon University. Professor; Adductive Crystallization, Flue-gas Desulfurization.

LeBlanc, Steven E., Ph.D., University of Michigan. Assistant Professor; Solution Metallurgy, Flow in Porous Media.

Rosen, Stephen L., Chairman, Ph.D., Cornell University. Professor; Polymeric Materials, Polymerization Kinetics, Rheology.

Varanasi, Sasidhar, Ph.D., State University of New York at Buffalo. Assistant Professor; Colloidal and Interfacial Phenomena, Biochemical Engineering, Membrane Transport.

For details write Dr. S. L. Rosen, Department of Chemical Engineering, The University of Toledo, Toledo, Ohio 43606

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The University of Tulsa

M.S. (Thesis and Non-Thesis) and Ph.D. Programs

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K. D. Wisecarver	— Fluidization, bioreactor modeling, mass transfer and adsorption in porous solids

FURTHER INFORMATION If you would like additional information concerning specific research areas, facilities, curriculum, and financial assistance, contact Prof. Luks, the Director of Graduate Programs.

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Mass Transfer
Modelling and Optimization
Particle Dynamics
Process Dynamics
Pulp & Paper
Rheology
Rotary Kilns
Separation Processes
Spouted Beds
Sulphur
Thermodynamics
Water Pollution

Inquiries should be addressed to:

Graduate Advisor
Department of Chemical Engineering
THE UNIVERSITY OF BRITISH COLUMBIA
Vancouver, B.C., Canada V6T 1W5

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FOR INFORMATION CONTACT

Dr. R. G. Barile, Chm.
Chemical Engineering
F.I.T.
150 W. University Blvd.
Melbourne, FL 32901-6988
(305) 768-8046

Dr. N. T. Stephens, Head
Environmental Engineering
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FOR INFORMATION WRITE TO:
Dr. Thomas C. Owens, Chairman
Chemical Engineering Department
University of North Dakota
Grand Forks, North Dakota 58202
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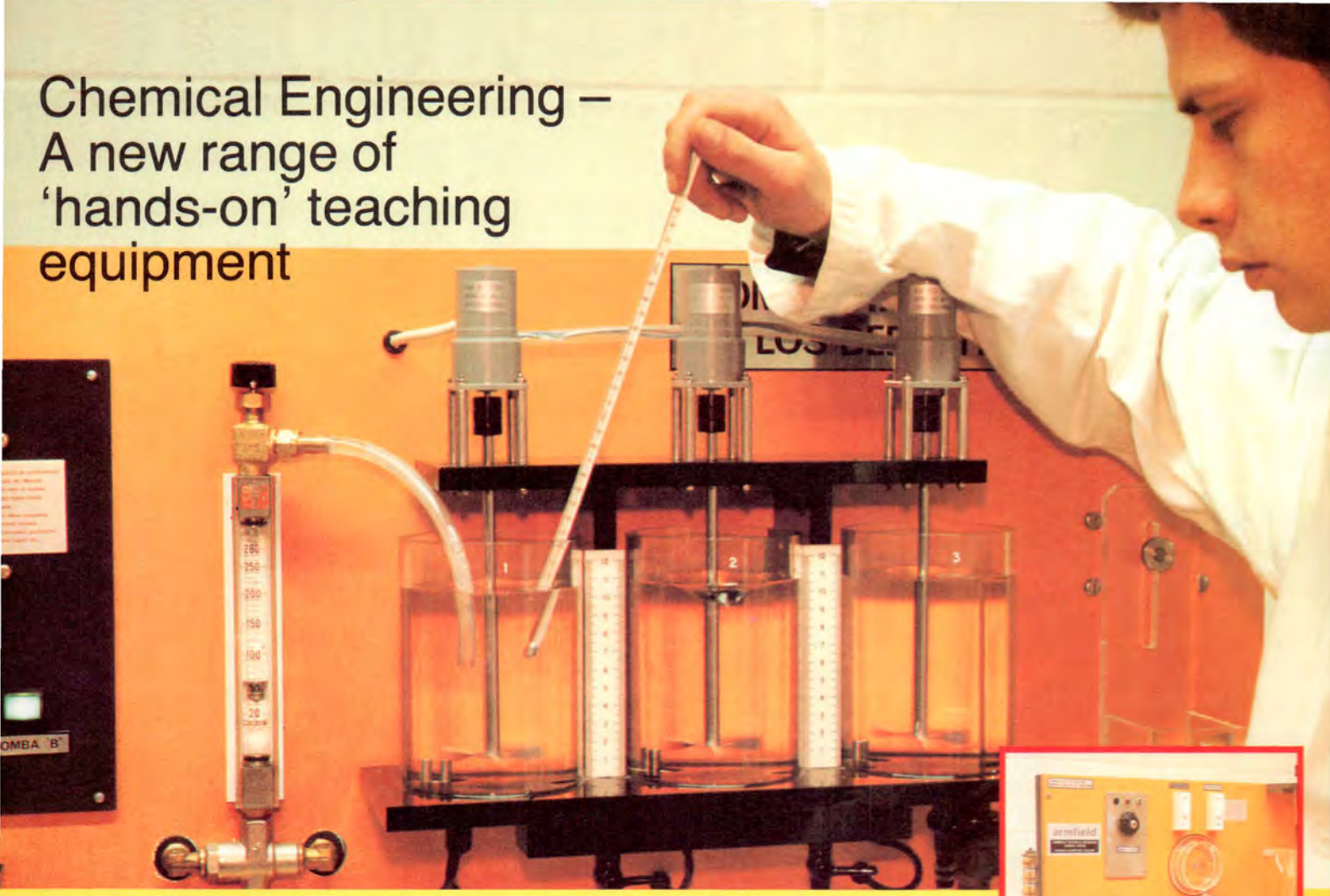
ACKNOWLEDGEMENT

CHEMICAL ENGINEERING EDUCATION

acknowledges and thanks

the 157 chemical engineering departments who contributed to our support in 1986 through bulk subscriptions, and the 131 departments announcing their graduate programs in this issue

Chemical Engineering – A new range of 'hands-on' teaching equipment



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